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HOW TO MARK ENGLISH ON GRADE IX MATHEMATICS, SCIENCE AND SOCIAL STUDIES PAPERS

A DISSERTATION

SUBMITTED TO THE GRADUATE FACULTY

IN PARTIAL FULFILMENT OF THE REQUIREMENTS FOR

THE DEGREE OF MASTER OF ARTS

DEPARTMENT OF EDUCATION

BY

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EDMONTON, ALBERTA

MAY, 1940.

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CHAPTER 1

WHY THE STUDY WAS MADE

The Object of the Study.- During the term 1936-37 the Department of Education of Alberta decided to allocate a portion of the total marks to English, on the final examinations in Mathematics, Science and Social Studies in Grade IX. The object of the following study was to attempt to devise some method of marking English on these content[1] papers, which would be practicable, and consistent. This work included the testing of several proposed methods of dealing with some particular phase of the topic. It involved a decision as to the best way of assigning the marks. Consideration of what constitutes an error in English at the Grade IX level was necessary. A practical classification of mechanical errors[2] had to be discovered, and the question of the relative importance, (or weight) of different errors had to be attacked. A decision

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1. Content Mark--Content Courses.- This refers to any subject which is given for its own sake, or provides its own "raison d'etre". Thus Social Studies is a content course; the mark assigned for the knowledge of Social Studies would be the content mark. In addition, and not in this sense a content mark, there would be the mark for English.

2. Mechanical Errors.- Mistakes in punctuation, capitalization, spelling, grammar, word usage and sentence structure. Flagrant mistakes in paragraphing would also be included. It is understood that "mistakes" takes some account of levels of maturity, and also of generally accepted standards of English usage, as contrasted with imposing a "literary" standard on all, and demanding "purists" usage.

had to be made about marking composition quality[3] or omitting consideration of it. Other difficulties peculiar to marking English on content courses had to be faced. Thus some answers may be listed. It is often difficult to determine where content ends and English begins. What is to be done with questions whose content mark is zero? Finally, with all these difficulties in mind, an attempt had to be made to devise a simple, usable marking scheme.

The Need for the Study.- The Department of Education allocated the amount of the mark for English as follows: in Mathematics, 10%; in General Science, 10% and in Social Studies, 20%. The problem of assigning the proportion of this mark to any one paper involved many difficulties, as mentioned above. If the Department's policy were to be abandoned because of these difficulties, it would be unfortunate, as will be shown. The need for this study, to aid in resolving these difficulties, at once becomes apparent.

Evidence from Other Studies.- A wealth of Evidence[4] supports the claim that transfer of training from English classes to other expressional situations is negligible

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3. Composition Quality.- Two compositions, each free from mechanical errors, can differ widely in effect. The intangible quality which characterizes this difference must lie in usages which are not errors, yet are progressively more or less suitable for attaining a pleasing effect, clarity, unity, coherence, thought value, style, force, interest, logical arrangement, etc. These are the terms which have been used to characterize "the intangible quality". Throughout this thesis the single term "composition quality" will cover all these separate qualities.

4. Bulletin No. 17, National Survey of Secondary Education.

unless strong administrative pressure is exerted on teacher and pupil alike. This transfer is precisely what is desired as the outcome of the study of English in the schools. More and more the notion that English is an artistic outlet or form of self-realization (for the average student) is declining. Rather English is looked upon as a tool of thought and a vehicle for expression in both public and private life. To attain this objective it is evident that all departments of the school must cooperate in insisting on good English usage.

When Searson[1] asked 2,799 English teachers to name the most urgent needs for the improvement of instruction in English, seven thousand three hundred and fifty-nine votes were given to the item "specific working plans for the co-operative teaching of English in all subjects." The National Survey of Secondary Education[2] examined 156 courses of study in 127 cities in 33 States in U.S.A. They noted a general reduction of time devoted to English as a subject in the Junior High School years. A course devoting five hours a week to English in the Junior High School is followed by 85% of the schools. They say "The reduction is based on the assumption that responsibility for the use of good English in the Junior High School belongs alike to all departments of the school". It is evident

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(4) cont'd. (1932) Page 70, Summary of Investigations Relating to Grammar, Language and Composition, by R.L. Lyman, Page 235.
1. Searson (English Journal XIII, Feb. 1924--99-114)
2. Bulletin No. 17, Monograph 1.

that in the U.S.A. the point advanced in the previous paragraph is recognized. In Alberta the Department of Education has allocated five thirty-five minute periods per week for English (including Literature and Composition) for the High School grades.

Conclusion.- These considerations are partly the basis for the statement that it would be regrettable for the Department to abandon its present policy regarding English. It might be suggested that the marking of English on content subjects be discontinued and that emphasis be laid on correlation between English and other subjects in the Course of Studies. Such a plan would be tantamount to abandoning the present policy. The State examination in such an educational set-up as ours, always sets the curriculum far more definitely than the Course of Studies. While no studies have "objectively" determined this, it is common knowledge and common-sense. The opinion of certain educational authorities in Alberta also supports this contention.

Summing up the above considerations, it was pointed out that the most commonly accepted general aim of teaching English was to give the student a tool of thought and expression in public and private life. It was shown that to do this the stressing of good English usage by all of the school's departments is necessary. Finally, to urge teachers to follow such a course, the continuation of the present examination policy is necessary. This study is an attempt to develop a practicable system for marking English in content courses.

CHAPTER 11

PRELIMINARY INVESTIGATIONS, THE SCOPE OF THE STUDY AND MATERIALS USED.

Preliminary Investigations.- A preliminary investigation was made, using Grade 1X answer papers of students in two Edmonton schools (King Edward and Macauley) on papers set by the author. This investigation made possible some preliminary work on a classification scheme for mechanical errors; and a decision as to whether an attempt should be made to mark composition quality.

The Scope of the Study.- The author attempted to use the Hudelson Composition scale in this preliminary investigation to mark composition quality. After sufficient practice to become familiar with the use of the scale, a number of papers were marked. Two weeks later when the same papers were re-marked, again using the scale, wide divergances were found. In addition it was noted that the scale did not seem adapted to the type of essay material found in Social Studies and Science papers, and of course was absolutely unsuited for Mathematics. The result of this attempt was to limit the scope of the study to mechanical errors. It was felt that a separate study of comprehensive scope would be required to investigate the marking of composition quality.

Further evidence on the wisdom of this decision in the light of the object of this study is necessary. If there is no relation between mechanical errors and composition quality, and if the latter is important, then a decision not to mark it would leave a faulty and imperfect system for the marking of English. At the outset it might be argued that

the difficult task of marking composition quality could be left to the English examination. It is contended that the style or form of setting forth an answer greatly influences the mark assigned on content courses. Actually, it has been found[1] that there is a correlation of between 0.40 and 0.54 between ability to organize material logically and composition scores. Colvin[2] found a good correspondence between inventive power and formal (mechanical) correctness. A study[3] reported in the National Survey of Secondary Education, Monograph No. 20, Bulletin 1932, No. 17; produces evidence of a high correlation between marks on compositions and the number of errors in mechanics, and the lack of relationship between the same marks and the thought value of the composition. Lyman[4] found a positive correlation between fluency (length of paper) and accuracy (absence of mechanical errors). He also noted "general excellence in substance and rhetorical form apparently is accompanied by a reasonable command of the mechanics of writing". On the basis of the above evidence one would not go very far wrong to confine the marks in English on

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1. Greene, Harry Andrew, as quoted by R.L. Lyman in "Summary of Investigations Relating to Grammar, Language and Composition" Monograph #36, page 192.
2. Colvin S.S. as quoted by R.L. Lyman in "Summary of Investigations Relating to Grammar, Language and Composition" Monograph #36, pages 189-190.
3. Katherine L. Healy "A Study of the Factors Involved in the Rating of Pupil's Compositions". Unpublished Master's Thesis, John Hopkins University, 1929.
4. Lyman, R.L. Summary of Investigations Relating to Grammar, Language and Composition, page 192.

content subjects to deductions for mechanical errors. Presumably the thought value here is rated by the content mark. While it does not follow that freedom from mechanical errors assures that a student has the ability to express himself well in English, or has the ability to make clear his meaning; it seems unlikely that he will produce these qualities in written material which is full of mechanical errors.

I conclude that there will be no serious defect in the marking scheme for content courses if only mechanical errors are marked.

Materials Used.- The materials used for the actual study were provided by the Examinations Board of the Department of Education. One hundred papers in each of the three subjects Mathematics, Science and Social Studies, were placed at the author's disposal. These papers had already been marked for content and English by the Department's Grade 1X markers. The papers were selected at random, except that the proportion of rural, small town and city students bore the same relation in the 100 papers selected as the totals in each of these classes bore to the total Grade 1X population of that year. The Social Studies examination was largely of the essay type, and since the average length of an answer paper was 1276 words, a total of approximately 127,000 words were read. This is a reasonably large sample compared with similar studies in marking English. The Science paper had only one essay--type answer and did not provide such a length of essay material. The Mathematics paper presented a special problem. The actual examinations

are to be found in Appendix 1 at the end of this work.

CHAPTER III

WHAT IS AN ERROR IN THE MECHANICS OF ENGLISH ?

The Purpose of Teaching English.- The answer to the question "What is an error in the mechanics of English" might seem at first glance easy. Actually it is tied up with one's conception of the purpose of teaching English and beyond that the fundamental purpose of language to human beings. The matter is so important in its immediate bearings on this study and its wider implications that a thorough discussion is necessary. Some principles which will be basic to weighting errors will be evolved now.

The psychologist would say that fundamentally language is a means of control. The sociologist tells us that it is essentially a means of communication. Basically, the process of using the language appears to be as follows: individual A has certain thoughts and/or feelings. He uses certain symbols, either sounds or written words, to express these. Individual B hears or reads these symbols, translates them into thoughts and/or feelings and the process is complete. Now the object of this process from A's point of view is to reproduce in B as nearly as possible the identical thoughts and/or feelings he experienced. If the process is verbal, then an interchange can take place and A can make certain that the process is completed as he wished. However, when the process is by means of written words, no such interchange is possible, especially since B may be remote in time or space. Evidently much more care

is required if the process is to be successful when written words are used. Both A and B are now concerned with this: is the meaning clear? That is, will the thoughts and/or feelings be the same for each? Obviously this condition will be present when the symbols used have a common meaning, that is, arouse the same thoughts and/or feelings in each. We have thus been able to reduce the process of using the language down to this fundamental necessity.

The further discussion of this question will be confined to the transmission of thoughts or ideas. The psychologist will say that there can be no thoughts without some feeling; which I admit. However, stressing the feeling end of the thought-feeling continuum leads to a discussion of connotation of words and appreciation in literature. I wish to confine the discussion to the other end--thoughts or ideas. Since the symbols used must have a common meaning, the greatest enemy of use of the language will be anything which destroys this common meaning. That would be, in the broadest sense, an error in the use of English. To push the matter somewhat further--where are we to go for this common meaning? The easy answer is--to the dictionaries and grammar books. The obvious question then presents itself: where are the writers of such books to go? We are forced back to the language as it is used, as a criterion of our common meaning. Now it is well known that dictionaries and grammar books lag well behind current usage in determining these common meanings. Some seem to deliberately stand for conservatism and the status quo in language.

The stand the school takes on this issue is important for this study. In these days of compulsory statewide education the school, if successful in its instruction, becomes in part the determiner of common meanings. Is it to oppose the trends of adult usage and of its own pupils when they escape its immediate influence? Specifically, is it useful to spend hours in school drilling students in the correct use of (say) shall and will, when most teachers know: (a) that most students will not use them "correctly" in after life (b) that this time could be well spent in other activities. If we examine possible reasons for the school taking the stand that old usages are correct, we find these:

1. Conservatism - a desire to expose students to what the educater received.

2. The easy way - it is easier to do this than to try to change.

3. Class-consciousness - the upper classes use language in a certain way and students are being trained to be like that group.

When put so baldly, no curriculum maker would care to associate himself with any one or combination of such reasons. While the school need not be the originator of new language meanings, it need not be the stalwart supporter of the old. This middle course can be steered by placing less emphasis on drill in certain instances. What instances? Two principles arising out of the previous discussion will guide us here:

1. The test of successful use of language is--has it

made your meaning clear?

2. Common meanings are determined by the way people actually use the language.

We have been thus driven to discuss the purposes of teaching English in our attempt to devise a system to evaluate this teaching. Any attempt to evaluate a change in a student's behaviour must define the extent and direction of the desired change. Since the writer could find no precise and definite statement of the desired change (the purpose of teaching English), one which was satisfactory to him had to be attempted, as stated in the foregoing discussion. The question "What is an error in the mechanics of English" now fits into this framework.

What is an Error for this Study? - Unlike the French, the English language has no Academy to determine what is correct usage. It is left to the innumerable daily choices of those who use English, to determine what the language shall be. This has its great advantages in flexibility and power of growth. Its disadvantages lie in the difficulty of knowing what is right and what is wrong. For example, we look up the word "nice" in the dictionary, find the meaning; yet universally hear it used in a different sense. On certain usages the standard grammars are as bad. For example, they rule that "It is I" is the correct statement, yet cultivated society regularly uses and sanctions "It is me", according to Leonard.[1] Certainly in the absence of an Academy, the grammarians and lexicographers must not be permitted to

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1 Sterling A. Leonard "Current English Usage"

pose as authorities on what should be. Rather, their task is to determine what is good usage, and to proclaim disputable usages as such.

There is a tendency nowadays to adopt the language which is written and spoken today as the criterion for good usage. Thus we find R.C. Pooley[1] giving the following definition: "Good English is that form of speech which is appropriate to the purpose of the speaker, true to the language as it is, and comfortable to the speaker and listener. It is the product of custom, neither cramped by rule nor freed from all restraint; it is never fixed, but changes with the organic life of the language."

The Alberta Programme of Studies prescribes that the text,"Sense and Structure" shall define the usages of Grade 1X students. Since this was one defined part of the English objectives for Grade 1X, it seemed necessary to accept its ruling on usages for this study. However, the book is singularly free from formal "rules of grammar". Most of the rules which are given are general and require interpretation. Thus the status of many usages must be found elsewhere.

We noted previously that both dictionaries and grammar texts are questionable guides as to what is good usage. In this study it was decided to accept the composition and grammar texts up to and including Grade 1X, as authorities. However, certain common usages often listed as errors have been challenged by Leonard.[2] How can one conscientiously mark as an error a usage which eminent judges have rated as established?

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1. Wisconsin Report on English Usage.
2. S.A. Leonard "Current English Usage".

As the monograph referred to points out,[1] grammar is merely the organized description or codification of the actual speech habits of educated men. A change in these habits must cause a change in the grammar texts. Leonard's study records the change in these speech habits on certain usages. As this is a very important study in determining what is an error, a list, compiled from the original data with the author's permission is supplied in Appendix 11. The ranking of the items indicates the agreement of the judges. Thus item 1 was rated as established by more of the judges than item 2, and so on. Actually, it was found that few of these items appear in their present form on Grade 1X papers, except those items which were ranked as established by the linguists and as disputable by all the judges. These were marked as genuine errors--the comma splice; none----are; it is me, and so on. Certain other usages listed were noted but not counted as errors in computing the mark assigned for English: if-------was; if-------wasn't (the subjunctive) and "the reason is because". Usages listed as established by both the linguists and all the judges were not marked as errors; the split infinitive, and use of further and farther being two cases in point.

Deviations from the spelling given in standard dictionaries were considered errors in spelling, since the author knew of no other method of determining what is an error in spelling.

The usual errors in punctuation were accepted with a

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1. Page 188

fairly liberal marking of the comma semicolon interchange. Capitalization is specific. In Word Usage, gross slang was marked as an error, improper coumpounds, interchange of adverbs and adjectives and the like. The errors in grammar accepted were reduced to a few simple ones, as can be seen later in the classification scheme, and this selection was based on the principles previously stated.

Regarding the question of usages which have not been taken prior to Grade X, it was decided that for the purposes of this study it was too difficult to determine what these were. Hence any accepted error in usage constituted an error for the purpose of this study. In general this seemed to be the policy followed by composition teachers and those who mark examinations. The writer has not been able to discover any list of errors which are overlooked at various levels. In the absence of specific grading of English work at the various school levels it seemed reasonable to mark all accepted errors.

Summarizing the foregoing discussion, we arrive at the following principles which will be used throughout this study:

1. Errors specifically mentioned as such in "Sense and Structure" are accepted as errors in the mechanics of English.

2. Certain other usages usually considered errors are noted as such, but no deduction is made in computing the English mark: if----was,"the reason is because"

3. Some usages are not considered errors, when established by both linguists and all the judges in Leonard's

study.

4. Standard dictionaries determine spelling.

5. All accepted errors are counted as errors i.e. no attempt is made to distinguish usages that Grade 1X students are not expected to have mastered.

6. Since the fundamental necessity for the successful use of the language in our own sense has been shown to be "make your meaning clear", this determines the seriousness of errors and hence weighting.

CHAPTER IV

THE CLASSIFICATION OF MECHANICAL ERRORS.

In order both to mark errors and to present findings of their frequency, some scheme of classification had to be adopted. Many studies[1] have been made of mechanical errors in English, and several classification schemes are recorded which range up to a 340 item classification. Willing[2] devised a classification scheme arranged under these headings: Spelling, Punctuation and Capitalization, Word Usage, Grammar and Sentence Structure. He found a shift in classifying the same material after a two month interval, ranging from 9% in the case of Word Usage to 30% in the case of Sentence Structure, with an average of 22% for all errors. However, he had a total of 340 items when one includes the subdivisions under each of the above major headings. It seems reasonable to expect that with fewer items there would be less shifting. Nevertheless, an important theoretical consideration is thus presented--it is difficult even for trained researchers to accurately classify errors with a fairly exhaustive list of items. This is important in the later discussion of the weighting of errors.

For the purpose of this study the classification needed to be simple. Only those items occurring most frequently could be arranged under a column heading. Since the Grade IX

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1. P.C. Symonds "Errors in Sentence Structure in the 9th Grade" Teacher College Record 1930 P. 53.
Stormzand and O'Shea "How Much English Grammar" p.166
G.M. Wilson "Language Error Tests" Journal of Educational Psychology, Vol. 13 pp.341-349, 430-437.
G.M. Wilson "Locating Language Errors of Children" Elementary School Journal Vol. 21, Dec. 1920 pp 290-296.
2. Matthew H. Willing "Valid Diagnosis in High School Composition"

text for English "Sense and Structure" has a section on each of the major headings used by Willing, these were used as a point of departure. A moderately large miscellaneous column could be permitted to care for errors occuring less frequently.

It was found during the preliminary investigation that one scheme would classify mechanical errors in both Science and Social Studies papers. The system was refined by use and in the end proved quite satisfactory. For Mathematics a modification of the scheme was found necessary. In many cases it was difficult to classify an error. Wherever several errors were present in one sentence this usually proved to be the case. To provide for this difficulty, a classification heading was introduced, which for want of a better term was called "clumsy sentence". Wherever more than three errors (excepting errors in punctuation) were detected in any sentence, it was recorded as "clumsy", and no other entry of the errors involved in it was made except mistakes in spelling.

The classification scheme used for Science and Social Studies papers follows:

Major Heading	Subdivision	Explanation
Spelling:	1. Misspelled 2. Careless 3. Apostrophe	(Other than errors attributed to carelessness or use of the apostrophe)
Punctuation and Capitalization:	1. Capital omitted at the beginning of a sentence. 2. Other mistakes in the use of the capital 3. Comma omitted A. to separate words in a series. B. to show a change of thought C. to set off an interruption.	

Major Heading	Subdivision	Explanation
	4. Period omitted at the end of a sentence.	
	5. Other errors in the use of the period.	
	6. Miscellaneous	(Comma added when not necessary, errors in colon, semi-colon, dash etc.)
Word Usage:	1. Specific	(Misuse of too, two, their, there, etc)
	2. General	(All other errors in the use of words)
Grammar:	1. Agreement of verb and subject in number and person.	
	2. Subordinate clause used as a sentence.	
	3. Phrase used as a sentence.	
	4. Other Mistakes in the use of the verb.	
	5. Miscellaneous errors.	
Sentence Structure:	1. What should properly have been two sentences, strung into one by:	
	(A)Conjunctions	(Usually ands)
	(B)Other means	(Chiefly the comma splice)
	2. What should properly have been more than two sentences strung into one by:	
	(C) Use of "ands".	
	(D) Other means	(often a combination of commas and conjunctions)
	3. Legitimate conjunction omitted.	
	4. Word order wrong.	
	5. Indefinite "it" referring to one of several antecedents in:	
	(a) The previous sentence	
	(b) The same sentence.	
	6. Other ambiguity of modifiers.	
	7. Clumsy	
	8. Important words which were not necessary, added.	
	9. Important words which should have been included, omitted.	
	10. Miscellaneous errors.	

Classifications in general vary greatly, and since headings, when not minutely detailed, do not describe the classification well, a rather extensive list of examples

follows. Where the classification was thought to be clear examples are omitted, and several are given where difficulties might arise. The source of the example is indicated in each case, "S.S." standing for an example taken from a Social Studies paper, and similarly "Sc." referring to an example taken from a Science paper.

Spelling: 1. Misspelled e.g.(Sc) conciderable, molacules,develope.
(SS) cival, appiont, quanity.
2. Careless e.g. (SS) "th" for the, "an" for and.
3. Apostrophe e.g. (Sc) mans needs, each others work, Saw's are operated---
(SS) workers organizations, the neighbors yard.

Punctuation
and Capitalization 2. Other mistakes in the use of the capital.
e.g.(Sc)-----when Electricity is used, ----the Germs will die.
e.g.(SS)-----the Oceans and Jungles---, jews, league of nations.

3. Comma omitted:
A. To separate words in a series. e.g. (Sc)---there would be no cheese no butter and no bread.
e.g. (SS) I would use electricity for stoves heaters irons and lights.
B. To show a change of thought. e.g (SS) We are able to keep in touch with people many miles away by the telegraph which carries messages overland.
C. To set off an interruption. e.g. (Sc) Electricity the greatest source of power is used for--
e.g. (SS)It also of course must be a place where transportation is available.
(SS) The waterfall flowing at a terrific speed makes water power.
(Sc) Oxygen if increased in quantity would affect the life of every creature on earth.

5. Other errors in the use of the period.
e.g. (SS) B.C. , gov't , etc , ----the following advantages. (a colon required).

Word Usage: 2. General
e.g. (Sc) Stones are not <u>burnable</u>, fastly, gooned, <u>Lots of</u> cattle----,---<u>polices</u> and fire protection.

e.g. (SS) a <u>minx</u> coat, the water <u>evaporizes</u>,

The people settle in certain areas----,Religious prosecution,----it was a mfg. town, The cops will pinch you, affect for effect.

Grammar: 4. Other mistakes in the use of the verb.
e.g. (Sc) If there would be a smaller percentage of oxygen.
5. Miscellaneous errors.
e.g. (Sc) If there was no germs----(These items were noted but not marked as errors)
(Sc) None of the great scientists----would never have been------.

Sentence Structure: 1. What should properly have been two sentences strung into one by: (b) Other means.
e.g. (Sc) Hot water rises when heated, in the case of a hot water tank the hot water enters the top of the tank.
e.g. (Sc) Our bread would not rise because there were no germs there would be no yeasts if there were no bacteria.
e.g. (SS)-----they can ship frozen mutton from New Zealand, across the equator and up to the British Isles without it spoiling it stays frozen the whole journey.
3. Legitimate conjunction omitted.
e.g. (Sc) Fumigate your home when diseases are spreading, burn all waste materials.
4. Word order wrong.
e.g. (SS) One in the city may golf----
(Sc) Then it starts to rain and makes a reservoir in time.
5. Indefinite "it" referring to one of several antecedents in the same sentence.
e.g. (Sc) The streams flow over the waterfall from there it goes to the power house and dynamo which makes electricity and by wires it is directed into people's houses.
6. Other ambiguity of modifiers.
e.g. (Sc) People would not have good beers and wines because they would not ferment.
(Sc) Your do any kind of work if you move a body some distance, which has weight.
(SS) Some people live in small houses with a large family.
7. Clumsy.
e.g.(SS) While in the city never a day goes by what someone hasn't got some contageous disease.
(Sc) Wipe or wash your eyes from dust with a rag and keep them in healthy way then,

your eyes will last all your life.

(Sc) If they come to different conclusions they try it again and check them.

(SS) From a river to the power plant where the water is taken from there to all kinds of different places it is force as a waterfall which the water runs freely with such force it is sent quickly into the air.

(SS) When a disease germ enters the human body it develops and forms into a serious situation, which sometimes is contagious and may prove fatal to other people.

(Sc) The development of industry has caused big manufacturing houses and buildings to up and people crowding to one place making it unhealthy.

8. Important words which were not necessary, added.
   e.g. (SS) By conserving of natural resourdes, I mean----
   (SS) Another thing of great in importance----
9. Important words which should have been included, omitted.
   e.g. (Sc) When it is coming down----?------kinetic energy
12. Miscellaneous errors in sentence structure: These included parallel structure. Gross violations of paragraphing were noted here.

The classification scheme for Mathematics was a modification of that described above. A few words will serve to explain the differences. Spelling was the same. In Capitalization and Punctuation, the miscellaneous item was largely made up of omission of the colon and omission of the period at the end of an abbreviation. Otherwise this major heading was the same. Word Usage was subdivided as follows:

1. Coined abbreviations (e.g. "A" for area, "per" for perimeter, "ct" for cent, etc.)
2. Other general word usage.

No cases of specific word usage occurred. The Grammar and Sentence Structure classifications remained the same, although some headings were only slightly used. Beyond the changes indicated the classifications were the same.

CHAPTER V

THE WEIGHTING OF ERRORS.

Assumptions.- Having decided what is a mechanical error in English for the purposes of this study and having developed a scheme to classify these errors; the next question is: how shall individual errors be weighted? The simplest and most commonly used weighting is to mark all errors equally. The assumptions which underlie this seem to be:

1. All errors are of equal importance or
2. Errors cannot be classified accurately enough to make an unequal weighting scheme reliable.

Referring to the discussion in a previous chapter on the fundamental purpose of the language, we note that assumption 1. above is untenable for this study, which accepts the criterion of good usage "does it make your meaning clear?" Apart from this, few would argue that a misplaced comma is as serious an error as a phrase used as a sentence. Rejecting assumption 1. we will examine assumption 2. This carries more weight. The evidence Willing[1] submitted on shifting, referred to earlier in this work, supports the assumption. Some constructions are difficult to classify, and if there is considerable difference in weight between the two possible classifications, grave inconsistency may arise. The English language is so flexible that hard and fast rules cannot be laid down defining all possible constructions as correct or incorrect, and stating precisely why. A glance over the examples of "clumsy" sentences given earlier in this work will bear out this point. In

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1. Matthew H. Willing "Valid Diagnosis--High School Composition"

spite of these difficulties, since to be consistent with the purposes of English as previously stated required the adoption of the assumption "All errors are not of equal importance", some a ttempt at weighting errors had to be made.

The preliminary investigation showed that it was only between or among a few classifications that shifting might occur. Hence it was decided to give certain relative weights to the various errors, and at the same time modify this so that the weights would be as nearly as possible the same for classifications between or among which shifting might occur. Thus the main objection of the second assumption stated above would be lessened.

Evidence from Other Studies.- The relative importance of various usages, and so of the errors made in these usages, has recently received a great deal of study.[1] The best criterion to use in weighting errors is a combination of social utility (Matravers uses this term for frequency of use of a form in actual speech, whether used rightly or wrongly), and frequency of error. The results of Matraver's study were not used because he obtained the social utility of various forms from use in spoken English. The basic idea, however, seems to be the best for weighting errors. A modified form of this idea was used by Stormzand and O'Shea,[2] who present findings based on written work. They tablulate the "error quotient" for 33 forms.[3] The error quotient is the number of

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1. C.H. Matravers "A Corrective Language Program" Eng. Journal, Vol. 1. Stormzand and O'Shea "How Much English Grammar"
2. opus cited.
3. " " p.191

errors in any particular form per thousand times the form is used. However, the social utility notion is left out--the number of times the forms are used in ordinary writing, (say) per 100,000 words. If this accompanied the error quotient one would have an excellent starting point for a sound weighting scheme.

Stormzand and O'Shea did a good deal of tabulating which is of general use for weighting. They found[1] that the average sentences of adults consist of the following forms: complex 44.8%, simple 38.0%, and compound 17.2%, Those of Grade IX students differ very slightly from these figures. Complex sentences consist of 32.8% with two or more simple clauses and 62.1% with complex clauses. These data indicate that ambiguity of modifiers, omission of a legitimate conjunction and faulty agreement between verb and subject are serious errors. Punctuation is important too, since it hinges on correct use of compound and complex clauses. The importance of spelling is shown in a table which shows that nouns and adjectives include 45 out of every 100 words in the samples they used. The work proved invaluable in the consideration of the weighting of errors. The authors have this to say about weighting:

"Previous studies in the matter of errors will have to be revised by some system of weighting. Several are suggested. That of "Error Quotients" was attempted, but the results cannot be considered highly satisfactory. A weighting according to judgments as to relative "heinousness" is also suggested."[2]

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1. opus cited P. 23
2. Stormzand and O'Shea "How Much English Grammar" P. 212

A study by Price[1] found that 85% of the errors made in the Junior High School are made up as follows:

% of Total Errors	Rank	
2.4	1	1. Fragments as complete sentences.
2.7	2	2. Incomplete constructions or undeveloped thought.
5.0	18	3. Necessary words omitted.
13.9	7	4. Stringy sentences.
12.0	12	5. Choppy clauses needing combination.
3.0	15	6. Faulty suborination of the main thought omitted.
4.0	11	7. Over repetition of connectives.
(The above classes include 43% of all errors)		
19.0	3	8. Omission of capital letters.
23.0	4	9. Omission of terminal punctuation.
Total 85%		

Rank means that 25 teachers ranked these and some other items in order of importance or seriousness as errors. Insofar as this classification coincides with that of this study, the above findings aided in deciding weights.

Weighting.- Summing up the above discussion, the following three principles emerge as general guides for the weighting of errors:

1. The worst error is that which obscures the clarity of the meaning.

2. A compromise must be made so that great differences in weight would not appear between or among classifications where shifting might occur.

3. The studies quoted above provided a starting point in the weighting of errors.

With the above principles in mind, the first decision to be made was the maximum deduction for each major class--spelling grammar, etc. Assuming that one is marking English on a paper on the basis of 100 marks, and deducting for errors,

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1.Price, as quoted by R.L. Lyman in "Summary of Investigations Relating to Grammar, Language and Composition" Monograph #36 p.111.

clearly one could not have the whole 100 marks deducted for (say) spelling. The principles listed above, and the amount of emphasis given to the corresponding sections of the Grade 1X English text, determined the maximum deductions. Then the deductions for errors itemized in the subdivisions of the major classes were decided upon. The whole process was somewhat arbitrary and subjective, since one had to keep the principles in mind and then decide, with no further guidance. The original weights follow. Since in Social Studies the mark for English was to be on a basis of 20, and for Science on a basis of 10, the maximum deductions for the major classes are given. However it was convenient in actual use to consider in each case that English was being marked on the basis of 100 and later transmute the score. This avoided fractional weightings.

Major Class	Max/100	Max/20	Max/10	Weight	Subdivisions of Major Classes
1.Spelling:	13	2.6	1.3	3	1. Misspelled
				1	2. careless
				3	3. apostrophe
11 Punctuation & Capitalization	12	2.4	1.2	4	1. Capital omitted at the beginning of a sentence.
				3	2.Other mistakes in the use of the capital.
					3. Comma omitted:
				1	A to separate words in a series.
				1	B to show a change of thought.
				1	C to set off an interruption
				4	4. Period omitted at the end of a sentence.
				2	5. Other errors in the use of the period.

Major Class	Max/100	Max/20	Max/10	Weight	Subdivisions of Major Classes.
				2	6. Miscellaneous punctuation.
III Word Usage:	13	2.6	1.3	5	1. Specific
					2. General
IV Grammar:	19	3.8	1.9	5	1. Agreement of verb in number and person.
				8	2. Clause used as a sentence.
				8	3. phrase used as a sentence.
				5	4. other mistakes in the use of the verb.
				5	5. miscellaneous errors.
V Sentence Structure:	43	8.6	4.3		1. What should properly have been two sentences strung into one by:
				6	(a) conjunctions
				5	(b) other means
					2. What should properly have been more than two sentences strung into one by:
				6	(a) use of "ands"
				5	(b) other means.
				5	3. legitimate conjunction omitted.
				5	4. word order wrong
					5. indefinite "it" referring to one of several antecedents, in:
				7	(a) the previous sentence.
				7	(b) the same sentence
				5	6. Other ambiguity of modifiers.
				15	7. Clumsy
				5	8. Important words which were not necessary, added.
				5	9. important words which should have been included, omitted.
				5	10. miscellaneous errors

The classification scheme used for marking Mathematics required different weightings, since so few sentences were used. Hence spelling was given more weight and the rest equal weights, as follows: Major Class

Major Class	Maximum deduction x/100	Subdivisions of Major Class Weight
I Spelling:	40	5 1. misspelled 1 2. careless 5 3. apostrophe
II Punctuation and Capitalization	10	(same as for Science and Social Studies)
III Word Usage:	10	5 1. coined abbreviations 3 2. other errors.
IV Grammar:	10	(same as for Science and Social Studies)
V Sentence Structure	10	ditto.

Principles or Assumptions.- Having devised a system for classifying and marking errors in English which seems usable by an ordinary marker, it is well to stop and re-examine its bases. Every organized study is based on certain assumptions or principles whether stated or not, and certain definitions not inconsistent with these assumptions or principles. For example, a rigorously scientific study, Geometry, has certain "axioms". Insofar as these can be proved, they are principles. To the degree that they are incapable of proof, they are assumptions. Now Euclid had certain axioms, on which are based Euclidean geometry. However, there is a non-Euclidean geometry developed by those who do not accept these axioms. Again, both the followers of Euclid and others made certain definitions not inconsistent with the assumptions or principles they had agreed to use. These are

again subject to variation, as, for example, the differing definitions of an acute angle developed within Euclidean geometry which lead to widely differing results (see 13th yearbook of the National Council of the Teachers of Mathematics) The present study and the weighted classification system it proposes to use is in an analogous position. There have been evolved various principles on which it rests, stated as such since evidence in support was always offered. Insofar as they cannot be proved they are assumptions. Finally, and not inconsistent with these, certain definitions about errors and weightings were made. Others may disagree with the principles or assumptions, and with the definitions, but that does not render this study any the less scientific, if Geometry can be used as a standard.

At this point a summary of the principles or assumptions (depending on the view of the reader as to what extent they have been proved); and the definitions on which the scheme proposed rests is presented.

Principles or assumptions:

1. A student's ability in English usage can be marked in content courses without marking composition quality as such.
2. The object in using English in our sense is communication, therefore the test of successful use of the language is--have you made your meaning clear?
3. Common meanings are determined by the way people actually use the language. Where it can be shown that common actual use differs from the dictionaries and grammar books (as in Leonard's list), such common actual use should not be called an error. When unquestioned the authority of dictionaries and grammar books must be accepted.
4. Within these limits all errors made by the Grade 1X student must be considered errors (i.e. one cannot say "A Grade 1X student cannot be expected to use that form correctly "and so omit that error).
5. All errors are not of equal importance.

6. A classification scheme as brief as the one presented can be used consistently and accurately enough to make a weighted classification scheme consistent for marking provided that there are not wide differences in weight between classifications where shifting is likely to occur.

Definitions.- The whole classification system itself is such a definition, not inconsistent with the above principles. The individual weights are definitions, and in the light of experience and further facts both of the above definitions may need revision. However, on the basis of the above principles and definitions certain findings were made which will be presented in the subsequent chapters. With other principles and/or definitions other findings might be arrived at.

CHAPTER VI

THE WEIGHTED CLASSIFICATION SYSTEM IN USE.

In actual use the weighted classification scheme was arranged on one sheet as in the illustration. A mark in any column indicates one error under that item. This arrangement was used for Social Studies, Science and Mathematics.

Dept's No	Max. Deduction 13			Max.	
	Spelling			Capitalize	
	misspelled	careless	apostrophe	Cap. omit. at beginning	Caps. others
	3	1	3	4	3
6590	////				
6590	////	///		///	//

Maximum Deduction 13						
Sentence Structure					Weighted error Deduction on one page	Mark for English X/20
other ambiguity of modifiers	clumsy	wd. words added	wd. words omitted	misc.		
5	15	5	5	5		
		1			20	
		//				5.0

The illustration shows part of the marks for the Social Studies paper of candidate #6590. It is marked in two parts, the upper one referring to the mark on one complete page and the lower one to the mark on all the rest of the pages. In Mathematics and Science this division was not made. Algebra and Geometry papers were marked separately. It will be noted that the weights assigned to each classification appear just below the subdivisions of the major classes.

In each subject the proportion of the marks allowed by the department was considered earned if no errors in English occurred. If errors occurred deductions were made from this

total. In the example illustrated above the student would obtain 20 marks for English on his Social Studies paper if he made no errors. It will be noted that he misspelled 8 words and had 3 errors listed as "careless" spelling. Therefore his total deduction under the weighting scheme would be 27. However the maximum deduction for Spelling is 13, therefore this is the deduction made. Similarly for the other classes the deduction was computed. In this case the total deduction on the basis of 100 was 75, or 15 on the basis of 20, therefore the student's mark for English on Social Studies was 5.

In addition to the markings noted above, several notations were made. Thus the first 10 misspelled words on each paper were copied down as actually spelled. It was found that Grade IX students use the colon in a very free fashion, so under the miscellaneous punctuation column errors in the use of the colon were specially noted. Similarly under miscellaneous errors in grammar the "If------was" constructions were specially noted, while under miscellaneous errors in sentence structure cases of articles added or omitted were noted. This makes possible the presentation of findings on the number of errors in additional classifications than those originally developed.

In marking each set of papers certain special circumstances were present. In Social Studies one question was based on map-work and so was not marked for English. Three other questions (numbers 8, 15, 17) were short answer questions and only spelling was marked. Beyond that all the

rest of the paper was marked for English. In Science some decision had to be made as regards punctuation and sentence requirements for the answeres to certain questions. The basis adopted was: English was marked on all questions. On questions 11-15 and 32-49 inclusive, a complete sentence with capital and period was required. On questions 16-25 inclusive, capitalization was not required but a period at the end was required. On questions 50, 51-54 inclusive, and 56, capitals were not required and only one period at the end of the last sub-item. It is worth noting that students did not seem to know what was required (from the point of view of English) on the above mentioned questions. In Algebra and Geometry all the English present on the papers was marked. In many cases especially in Algebra, little English was used.

As each set of papers was marked, a record was also made of the corresponding scores for the following:

1. The Department's mark on the English examination on questions 1-5 inclusive (mechanical errors?)

2. The Department's mark on the English examination for the essay.

3. The Department's mark for the sum of the above based on 100 marks.

4. The general test (language) score.

5. The Department's content mark for Social Studies.

6. The Department's mark for English on Social Studies.

7. The number of short-answer questions in Social Studies that were answered by the candidate and the total number of questions answered.

8. The Department's content mark for Algebra and Geometry.

9. The Department's mark for English on Algebra and Geometry.

10. The general test (mathematics) score.

11. The Department's content mark for General Science.

12. The Department's mark for English on General Science.

These data permitted comparisons and correlations, which will be presented later.

CHAPTER VII

THE FREQUENCY OF ERRORS.

Most of the results of the classification of errors are presented in tabular form. Table I sets forth all the errors of all kinds which were recorded for the 100 Social Studies and 100 Science papers. By way of explanation, the first item means "There were 970 errors in spelling on 98 out of 100 Social Studies papers, including repetitions of the same error". The rest of Table I is read in a similar fashion.

Table II presents all the errors of all kinds which were recorded for 100 Geometry and Algebra papers. It is read in the same way as Table I. Items 1 and 2 under Spelling mean that in Geometry there was a total of 174 errors on 66 out of 100 papers, and that two students repeated a misspelled word once or more times. Actually each student repeated the word once, so that there were 172 errors not including this kind of repetition. However a different kind of repetition is included. Any one word may be misspelled by several students. This kind of repetition is included in the total. Item 6 under "Capitalization and Punctuation" for Algebra is high because a period was required at the end of a mathematical statement, even if the statement was in symbols.

Table III presents the range and frequency of certain selected errors. In general those selected were the ones with a high total, which occurred on 50 or more papers and were considered serious errors. Thus a similar analysis of omitted commas and periods, articles inserted and omitted and important words added or omitted was not included.

TABLE 1

MECHANICAL ERRORS ON 100 SOCIAL STUDIES AND 100 SCIENCE PAPERS

Classification and Explanation	Social Studies		Science	
Spelling:	No. of errors	No. of papers	No. of errors	No. of papers
1. Total number of errors in spelling of all kinds including repetition of the same error.	970	98	455	88
2. Total number of errors in spelling of all kinds not including repetition of the same error.	914	98	440	88
3. Spelling errors which repeated an error previously made, once, twice or more times.	35	25	15	14
4. "Careless" errors (Sub item 2 in Classification Scheme)	67	37	9	9
5. "Apostrophe" errors (Sub item 3 in Classification Scheme)	90	47	22	18
Capitalization and Punctuation:				
1. Capital omitted at the beginning of a sentence.	73	36	264	55
2. Other mistakes in the use of the capital.	178	54	38	22
3. Comma to divide words into a series omitted.	126	42	8	5
4. Comma to mark a change of thought omitted.	547	97	165	68
5. Comma to set off an interruption, omitted.	81	35	15	7
6. Period omitted from the end of a sentence.	339	86	996	98
7. Other mistakes in the use of the period.	38	24	6	5
8. Colon omitted.	57	35	(not recorded)	
9. Miscellaneous punctuation.	99	57	30	20
Word Usage:				
1. Two, too and to used wrongly.	33	23	25	19
2. Of for off and vice versa.	3	3	12	9
3. There for their.	25	13	6	5
4. Their for there.	17	13	1	1
5. Other specific word usage.	4	4	0	0
6. General word usage.	661	100	233	90
Grammar:				
1. Subjunctive "if--was" or "if--wasn't".	62	45	(not recorded)	

TABLE 1 (cont'd)

MECHANICAL ERRORS ON 100 SOCIAL STUDIES
AND 100 SCIENCE PAPERS

Classification and Explanation	Social Studies		Science	
Grammar (cont'd):	No. of errors	No. of papers	No. of errors	No. of papers
2. Agreement of verb and subject in number and person.	101	55	19	19
3. Subordinate Clause used as a sentence.	176	62	100	46
4. Phrase used as a sentence.	34	16	38	23
5. Other mistakes in the use of the verb.	54	38	9	8
6. Miscellaneous errors.	20	15	0	0
Sentence Structure:				
1. What should properly have been two sentences strung into one by a conjunction.	21	18	3	2
2. What should properly have been two sentences strung into one by other means.	198	75	58	34
3. What should properly have been more than two sentences strung into one by "ands"-------	3	3	0	0
4. What should properly have been more than two sentences strung into one by other means.	55	27	8	5
5. Legitimate conjunction omitted..	51	34	12	10
6. Word order wrong	57	45	8	7
7. Indefinite "it" referring to one of several antecedents in a previous sentence.	15	15	3	3
8. Indefinite "it" referring to one of several antecedents in the same sentence.	20	16	4	3
9. Other ambiguity of modifiers.	89	51	24	22
10. Clumsy	39	27	5	5
11. Important words which were not necessary, added.	162	80	33	24
12. Important words which should have been included, omitted.	183	80	52	42
13. An article added when not needed.	14	14	1	1
14. An article omitted.	128	50	16	6
15. Miscellaneous errors.	12	10	16	14

TABLE 11

MECHANICAL ERRORS ON 100 MATHEMATICS PAPERS

Classification and Explanation	Geometry		Algebra	
Spelling:	No. of errors	No. of papers	No. of errors	No. of papers
1. Total number of errors in spelling of all kinds including repeats of the same error.	174	66	61	46
2. Repetitions of an error in spelling made previously.	2	2	0	0
3. "Careless" errors (Sub item 2 in Classification scheme)	13	12	2	2
4. "Apostrophe" errors (Sub item 3 in Classification scheme)	1	1	3	3
Capitalization and Punctuation:				
1. Capital omitted at the beginning of a sentence.	19	10	4	2
2. Other mistakes in the use of the capital.	4	4	4	3
3. Comma to divide words into a series, omitted.	3	3	0	0
4. Comma to mark a change of thought, omitted.	142	77	6	4
5. Comma to set off an interruption, omitted.	55	26	0	0
6. Period omitted from the end of a sentence.	414	91	329	90
7. Other mistakes in the use of the period.	75	61	87	56
8. Colon omitted.	16	14	27	25
9. Miscellaneous punctuation.	71	24	44	18
Word Usage:				
1. Coined abbreviations.	9	8	38	32
2. Other errors in word usage.	52	34	5	5
Grammar:				
1. Agreement of verb and subject in number and person.	14	14	4	4
2. Subordinate clause used as a sentence.	28	23	21	19
3. Phrase used as a sentence.	8	8	11	11
4. Other mistakes in the use of the verb.	4	3	0	0
5. Miscellaneous errors.	0	0	0	0

TABLE 11 (cont'd)

MECHANICAL ERRORS ON 100 MATHEMATICS PAPERS

Classification and Explanation	Geometry		Algebra	
Sentence Structure:	No. of errors	No. of papers	No. of errors	No. of papers
1. What should properly have been two sentences strung into one by means of a conjunction.	0	0	0	0
2. What should properly have been two sentences strung into one by other means.	10	8	1	1
3. What should properly have been more than two sentences strung into one by "ands".	0	0	0	0
4. What should properly have been more than two sentences strung into one by other means.	0	0	0	0
5. Legitimate conjunctions omitted.	1	1	0	0
6. Word order wrong.	4	4	3	3
7. Indefinite "it" referring to one of several antecedents in a previous sentence.	0	0	0	0
8. Indefinite "it" referring to one of several antecedents in the same sentence.	0	0	0	0
9. Other ambiguity of modifiers.	1	1	0	0
10. Clumsy.	3	3	0	0
11. Important words which were not necessary, added.	11	10	6	6
12. Important words should have been included, omitted.	34	24	22	15
13. An article omitted.	19	7	0	0
14. Miscellaneous errors.	0	0	0	0

When the headings are expanded, they read as follows:

1st column. Number of errors occurring on one paper.
2nd column. All spelling errors including repetitions made on Social Studies papers.
3rd column. All spelling errors including repetitions made on Science papers.
4th column. All general word usage errors on Social Studies papers.
5th column. All general word usage errors on Science Papers.
6th column. All errors in using the subordinate clause as a sentence on Social Studies papers.
7th column. All errors made on Social Studies papers by stringing what should have been two or more sentences into one by any means.

The table reads like this: two papers had no errors in spelling on Social Studies four had one error (of any kind, including repetitions) and so on. Twelve papers out of 100 in Science had no errors in spelling. The other columns are read similarly.

Table lV presents 508 errors in Spelling on 100 Social Studies papers. The selection was made by recording the original spelling of about the first 10 errors on each paper. Thus some papers had all the spelling errors recorded while others had only some. The object was to present a representative list of errors. According to this selection the very poor speller is not given undue weight. Considering the worst case (43 spelling errors on one paper), this student, an undoubtedly poor speller, contributes only about 10 words to the list presented in Table lV . On this basis 508 errors, including repetitions, are presented. The actual spelling as used by the student, is given. Where it was considered impossible for the reader to ascertain the word signified, the correct spelling is given in brackets. As far as possible an alphabetical list was arranged. However, it was modified so that various spellings of any one word are placed together. Beside each word in the

TABLE 111

RANGE AND FREQUENCY OF CERTAIN ERRORS

	Number of Papers on Which These Errors Were Found					
No. of errors.	All spelling on S.S.	All spelling on Sc.	Gen. Word Usage on S.S.	Gen. Word Usage on Sc.	Sub. Cl. as sentence on S.S.	2 Sentences strung into one on S.S.
0	2	12	0	10	38	17
1	4	16	6	23	32	29
2	2	19	10	31	11	13
3	8	14	9	16	6	11
4	5	8	11	10	3	8
5	10	3	12	3	0	8
6	11	5	11	5	1	5
7	4	7	7	1	3	2
8	2	1	7	1	1	2
9	2	2	4		2	1
10	8	1	6		1	1
11	3	1	4		0	1
12	7	1	2		1	1
13	2	2	2		0	1
14	0	0	2		0	
15	0	1	3		0	
16	2	1	2		0	
17	0	3	0		1	
18	2	1	0			
19	3	1	2			
20	2	0				
21	2	0				
22	1	0				
23	6	0				
24	0	0				
25	2	0				
26	1	0				
27	0	0				
28	0	0				
29	2	1				
30	0					
31	1					
32	1					
33	0					
34	0					
35	0					
36	0					
37	1					
38	0					
39	0					
40	0					
41	1					
42	0					
43	1					

"frequency" column is inserted the number of times the word in its given form occurred. It is important to note that in recording these words no repetitions occurring on one paper were recorded. For example, if "acros", "accross" and "accross" occurred on one paper. the record for the list of Table 1V would be "accross" and "acros". Thus the list is not at all affected by one student misspelling a word and then repeating this error several times. By rejecting these repetitions, careless errors, and mistakes in the use of the apostrophe, and only considering about the first 10 words on any paper, the original 970 errors was reduced to the given 508. Thorndike's "The Teacher's Word Book" was consulted for each word, and in the column headed "Position" its standing taken from that work is recorded. Thus the word "across" ranks 84 1a 5 in "The Teacher's Word Book". Thorndike explains this rank as follows: "For the 1st 500 words 1a 2 means that the word is in the second 100 words; for the 1st 5000 words 43 2a means that the word has an importance of 43 and is in the 1st half of the second 1000 words-------. It should be noted that, except for special reasons, separate entries are not made of plurals in "s"; plurals where "y" is replaced by "ies"; adverbs formed by adding "ly"; comparatives and superlatives formed by adding "er" and "est", or "r" and "st"; verb forms in "s,d, ed" and "ing"; past participles formed by adding "n" and adjectives formed by adding "n" to proper nouns. For example: boys, girls, berries are counted in with boy, girl, berry, badly, sadly are counted in with bad, sad---------"

We will for convenience call the different words formed as

described above, "derivatives" of the original word. The key to Thorndike's ranking is as follows:

Credit Number	Position of word.
49 or over	1-1000
29 to 48	1001-2000
19-28	2001-3000
14-18	3001-4000
10-13	4001-5144
9	5145-5544
8	5545-6047
7	6048-6618
6	6619-7262
5	7263-8145
4	8146-9190
3	9191-10,000

It was found that many spelling errors occur in derivatives of the original word. So long as the original word was in Thorndike's list, a blank is left to indicate that the ranking has no significance as far as spelling is concerned. e.g. quickle-----. Actually "quick" is listed in the Word Book but "quickly" is not. In the case of derivatives where the error would have occurred, had the student written the original word, the ranking of the Word Book is given. e.g. "famalies----83 la 5". In those cases where a word was not found in the Word Book, "N.L." appears beside it, standing for "not listed".

The number of different words misspelled in the list of Table IV (that is, omitting derivatives), is about 321. This is not exact since it is difficult in some cases to decide what is a derivative. The total number of different spellings (without including repetitions) is 416. That is, by count there are 416 words in the list. Including the repetitions listed in the frequency column, the total number of errors in the list is 508. There are 62 different errors not listed in the Word Book.

This means that of the 321 different words in the list, 62 are not in the first 10,000 most important words according to the Word Book. However of these 17 are proper nouns. e.g. Celyon, Hon Kong, Graph Zepelin. Of the 508 errors, 107 are not listed in the Word Book (this now includes repetitions); and of these 107, 32 are proper nouns (again including repetitions). The number of different errors due to mistakes in derivatives of the original word is 39. Including repetitions there are 56 errors made in derivatives. In tabular form:

	No. of diff. words.	No. diff spellings	Total N.L.	N.L. (proper nouns)	Deriv-atives.
Without repetitions of the same error	321	416	62	17	39
Including the same error repeated once or more times.		508	107	32	56

The matter now lies clear: of 508 errors in spelling made on the 100 Social Studies papers, 107 were not in the first 10,000 words of the Word Book. Of the remaining 401, 56 of the errors occurred in derivatives of the original word.

Table V presents the selection of those words from among the 508 of Table 1V, which lie within the first 5000 of the Word Book. The arrangement is by five hundreds. In the first 500, the figure at the left of the word indicates the hundred to which it belongs. Thus "across" is in the 5th hundred of the first 500 words of the Word Book. The figure at the right of the word indicates the frequency of error. Thus "across" was misspelled 5 times, on 5 different papers. The figure at the bottom of the column is the number of different words in that column. Thus there are 33 words in the first column. The figure at the foot of the column and to the right indicates the number of errors. Thus

TABLE IV

508 Errors in Spelling from Social Studies Papers.

Word	Frequency	Position.	
accross	3	84	1a 5
acrost			
acrossed			
acident		26	4a
aford		23	3a
afford			
Alsac		N.L.	
apperatus		7	
appartus			
aperatis			
aperatures		6	
apparal	2	10	5b
apparell	2		
aeroplain	2	4	
aerplane			
airoplane	8		
airplain	2		
areroplane			
arial		5	
armay		59	1b
arroused		11	5b
arrises		24	3a
architecs		5	
arn't		6	
artificial		12	5a
assisstance		17	4a
assissted			
assistes		29	2b
ascends		6	
atall		N.L.	
axils		8	
babys		61	1b
ballon		5	
bannanas	2	14	4b
banannas			
beat (for beet)		11	5b
beleive		77	1a 5
belles			
benifit	5	30	2b
berrie		31	2b
biggin		97	1a 3
bom (for bomb)		4	
boulovards		N.L.	
Britian	2	19	3b
Brition			
Britien			
brout (for brought)		76	1a 5
busses	5		
buisness		73	1b
bycicle		16	4a
cand (for candy)		30	2b
calfs			
canot		20	3b
carefull		59	1b
cellolose		N.L.	
cellouse	2		
celophane		N.L.	
Celyon		N.L.	
cerial		6	
ceral (for cereal)			
Chineze		12	5a
chanche		55	1b
chiped (for chipped)			
cheep		34	2b
cheapier			
citys (for cities)	4		
citties			
citie	2	114	1a 2
cival		24	3a
cleen		67	1b

TABLE IV (cont'd)

508 Errors in Spelling from Social Studies Papers.

Word	Frequency	Position.
closser		
cloths (for clothes)		68 1b
clothe	2	54 1b
coak (for coke)		N.L.
coark		11 5b
comminuty		15 4b
commuties		
cummunity		
comunity		
Communistics		N.L.
comparitively		11 5b
controll		31 2b
controlled		
contagous		5
convenence		12 5a
conveinces		
convenicens		
conviences		
conveneinces		
conciderable	2	17 4a
contac		4
contageous		5
cources	2	91 1a 4
coullies		N.L.
crumbels		N.L.
creak (for creek)		16 4a
curnels (Kernels?)		6
delt		N.L.
dept (debt)		39 8a
depleated		N.L.
dessert		41 2a
deisal		N.L.
diesal		
dieing		
dyiing (for dyeing)		23 3a
dictaitor		N.L.
differint		63 1b
dinning		
dipt		N.L.
dirigable		N.L.
distroyed		50 1b
distruction	2	23 3a
disasterous		4
docter		51 1b
doeing		N.L.
draperys		7
easly		31 2b
economicly		N.L.
electricty		5
electrisity		
electrisitie		
elsess		
elliminate		N.L.
immerges		8
imployed		37 2a
emploier		7
enterprizes		13 5a
incourage		25 3a
intirely		51 1b
enabeles		15 4b
equiped	2	
eskimoes		4
Etheopia		N.L.
excile		15 4b
experment		12 5a
faceing		
Fascits		N.L.
Facism	3	
Facist		
fascits		
Facsism		
familys	4	
famalies		83 1a 5
fertalizer		8
firtalize		9
flie		76 1a 5
fore (for four)		114 1a 2
forfill (for fulfil)		18 4a

TABLE IV (cont'd)

508 Errors in Spelling from Social Studies Papers.

Word	Frequency	Position	Word	Frequency	Position
foriegn	42	2a	insolate	3	3
forbides			inocculate		N.L.
freinds	106	la 3	endustries		29 2b
			incubater		4
gased			encreased		53 1b
Germanie	28	2b	inbedded		N.L.
golph	6		sinerator		N.L.
goverment	62	1b	Japaneze		12 5a
Governement			journies		
goveronor	37	2a	knews (for news)		45 2a
gradualy			knew (for new)		160 lal
graphting	5		know (for now)		174 la 1
Graph Zepelin	N.L.		kingds (for kinds)		118 la 2
grate (for great)	159	la 1	keap		112 la 2
greatings	N.L.				
			Lawrience		9
grocerie	9		layed (for laid)		58 1b
grocieries			labratories		5
			Lenon		N.L.
growen			leauge		35 2b
			leizure		13 5a
hapening	63	1b	lessoned		11 5b
Healtheir			legumenous		N.L.
helthy	16	4a			
hering (herring)	6		libraryes		34 2b
			liberarys		
hight	54	1b	librairies		
hights	54	1b	librarys		
hids (for hides)			liseance		15 4b
Hon Kong	N.L.		liscenses		
hoserey	6				
			locallity		5
hospitables	25	3a	lustorous		N.L.
hospitols	25	3a			
			machien		42 2a
househould	28	3a	maney (for many)		153 la 1
humen	39	2a	Manchira		N.L.
			maner		58 1b
emmigrant	4		manuer		9
immergencies	6		Markism		N.L.
immergency			Medeteranian		8
			Medditeranian		
imposible	35	2b	Meditteraneon		
emplements	12	52			
insets (for insects)	24	3a	Mechenzie		N.L.
instale	10	5b	Mechical		5
			mochanical		

TABLE IV (cont'd)

508 Errors in Spelling from Social Studies Papers.

Word	Frequency	Position	Word	Frequency	Position.
McOrmic		N.L.	plaine	78	la 5
meteriel		45 2a	planed (for planned)		
micrascope		N.L.			
mittin		12 5a	pionos	17	4a
mits	2	3	poluted	7	
missionarys			polititians	5	
mollasses		5	possestion	36	2b
monie		109 la 3	prenier	4	
Montral		5	programes	11	5b
Montrial					
			proppeller	N.L.	
mountion		77 la 5	propelor	2	
municiple		3	propeler		
Mussileine		N.L.	propellor	3	
muscrat		4	perpeller		
muzzeld			propellor		
muttoon		11 5b			
			proove	63	1b
nieghbours		66 1b	propibly	36	2b
nabors		66 1b	promision	14	4b
			prosses (processes)	23	3a
naturel		50 1b	propietor	7	
naturly			practally	23	3a
naturaly					
			quarentine	N.L.	
nead	2	109 la 3	quarintine	2	
nexed		97 la 3	quarintining		
now days		6	quarentien		
nitrigon		N.L.	quarantien		
nutritéon		N.L.	quaurinteen		
numberous		27 3a	quaranteened		
			quarenteen		
occured			quarenteaned		
ocian		51 1b	quaranteen		
ordiniry		27 3a	quarentieans		
			quarentens		
Panamal		15 4b			
pasturized		N.L.	quickle		
pastuerized			quitness	6	
			quation (eq)	N.L.	
pavilions		8			
payed (for paid)	2	37 2a	rabits	31	2b
pedellers		7	radioes		
peopl		126 la 2	recieve	88	la 4
			recieving	2 88	la 4
perferated		N.L.	reffering	22	3b
preforated					
			refrigerater	2 4	
perserving		7	refrigeation	4	
presevere		7			
perculator		3			
perchasing		41 2a			

TABLE IV (cont'd)

508 Errors in Spelling from Social Studies Papers.

Word	Frequency	Position		Word	Frequency	Position	
reforestration		N.L.		stabalizing		N.L.	
reforestratum				statiam		56	
				Stephenson		4	
regualerly		46	2a	stingz			
relateted				stripes (for strips)	2		
reenforced		N.L.					
				strick (for strick)		19	3b
rescources		9					
resourses	4	9		streched		49	2a
recorses		9		Switerland		9	
				swiming			
resevior		3		sweathers		10	5b
resourt		20	3b	sweper		6	
resperation		N.L.					
reson (for reason)		81	la 5	tapica (for tapioca)		N.L.	
ripins		17	4a				
robs (for robes)		28	3a	tarrifs		7	
				tarriffs		6	
Rossfeldt		5					
Roosvolt				teliscopes			
Roosvelt				telaphone		23	3a
				telivision		N.L.	
rout (for route)	2	26	3a	telegraphey			
rownd		105	la 3	tensil		N.L.	
runn		115	la 2	thier	4	177	la 1
runing							
				to-gether		97	la 3
sanitoriams	2	N.L.		to gether		97	la 3
scies		69	1b				
seperator	8	4		traile		23	3b
seriouse		29	2b	travells	3		
sesspit		N.L.		traveling			
sewiage		N.L.		trian (for triangle)		9	
Shanghi		N.L.					
Shang Hi				trieing			
shoud		130	la 2	tryes			
shedds		40	2a	Trotzyky		N.L.	
shiped	7						
shoie		72	1b	tubercolosis	2	3	
shure		94	la 3	tuberclosis		3	
sipply		54	1b				
skies (for skiis)	7	N.L.		Tweedsmure		N.L.	
sliegh		13	5a	Tweesmuir			
smoothely				Tweedmuir			
sothern		34	3b	Tweedsmir			
solialism		4		Tweedsmur			
speach		45	2a	Tweedsmure			
				Tweedsmeir			
				Tweedsmore			
Stalien		N.L.					
Stalene				untill		108	la 3

TABLE IV (cont'd)

508 Errors in Spelling from Social Studies Papers.

Word	Frequency	Position.		Word	Frequency	Position.
usully	2	55	1b	Zeplins		N.L.
usualy				Zeppilin		
usless		21	3b			
useage		4				
vacum	3	3				
vaccum	5					
Vancouer		N.L.				
vaxanations		N.L.				
valueable		29	2b			
valuabale		29	2b			
vacinated	2	N.L.				
vegitables		30	2b			
visibilie						
waists (for wastes)		54	1b			
wearth		70	1b			
weisels		4				
woolen	3	15	4b			

in our sample of 508 out of the total 970 spelling errors on 100 Social Studies papers, 46 occurred from the first 500 words of the Word Book.

Referring back to the explanation of Table 1V, we note that there were 321 different words. Of these, 155 different words occur in the 1st 5000 of the Word Book. Of the 508 errors of Table 1V, 195 come from the 1st 5000 words of the Word Book. This leaves 150 errors which come from the 2nd 5000 words of the Word Book. We are now in a position to give the setting of all 508 errors of Table 1V: 1st 500-46, 2nd 500-29; 3rd 500-17; 4th 500-24; 5th 500-17; 6th 500-10; 7th 500-11; 8th 500-15; 9th 500-14; 10th-500-13. Total 195 in the 1st 5000. In 2nd 5000-150. Not listed, including proper nouns, 107. Derivatives, 56. This totals 508.

Table V1 presents a list of 66 words from Table 1V, each of which at least two different pupils misspelled. The word is given first, and includes derivatives, e.g. cheap includes cheaply and cheaper if errors were made in these derivatives. The second column gives the number of different spellings. Thus "accross", "acrost","acrossed" (see table 4). The third column gives the total number of errors in the spelling of this word or its derivatives. The table is made clear by referring back to these words in Table 1V.

It is interesting to note in connection with Tables 1V and V1, that since the number of papers considered was 100, and each repeat of any one error represents a different paper, one may say (cf. Table V1); at least 5% of the students in Grade 1X misspell across, according to out sample. Similarly (cf.

TABLE V

Spelling Errors from Social Studies Papers in the First 5000 of Thorndike's Word List.

In 1st Thousand					In 2nd Thousand			
Hundred		Frequency		Frequency		Frequency		Frequency
5	across	5	army		debt		assists	5
5	believe		baby (ies)		desert		benefit	
3	begin		business		different		berry	
5	brought		careful		destroy		candy	
2	city	2	chance		employ		cheap	
4	course	2	clean		foreign		control	
5	families		cloth	2	governor		easily	
5	fly		clothes		human		Germany	
2	four		doctor		news		impossible	
3	friends		entire		machine		industries	
1	great		government		material		league	
4	grown		height		paid	2	library	
1	new		increase		purchase		possession	
1	now		laid		shed		probably	
2	kind		manner		speech		rabbit	
2	keep		neighbor		stretch		regular	
1	many		natural				serious	
3	money		ocean		16	17	southern	
5	mountain		prove				vegetables	
3	need	2	skies				valuable	
3	next		shoe					
2	people		supply				20	24
5	plain		station					
4	receive	3	usual	2				
5	reason		waste					
3	round		worth					
2	run		happen					
2	should							
3	sure		27	29				
1	their	4						
3	together	2						
3	until							
1	would							
	33	46						

TABLE V (cont'd)

Spelling Errors from Social Studies Papers in the First 5000 of Thorndike's Word List.

In 3rd Thousand	Frequency		Frequency	In 4th Thousand	Frequency		Frequency.
afford		Britain	4	accident		banana	2
arise		cannot		assistance		community	4
civil		refer		bicycle		enable	
destruction	2	resort		considerable		2 exile	
encourage		strict		creek		license	2
hospital		trail		fulfil		Panama	
household		useless		healthy		permission	
insect				pianos		woolen	3
numerous		7	10	ripen			
ordinary						8	15
process				9	11		
practical							
robes							
route	2						
telephone							
15	17						

In 5th Thousand	Frequency		Frequency.
artificial		apparel	4
Chinese		aroused	
convenience	5	beet	
enterprises		cork	
experiment		comparative	
implements		install	
Japanese		lessen	
leisure		mutton	
mitten		programme	
sleigh		sweater	
10	14	10	13

Table 1V), one may say, at least 11% of the students in Grade 1X misspell "accident", according to our sample. It is well to note that our sample is small (100 out of a population of about 8700). It is also well to note that since we only have 508 out of 970 errors in spelling for Table 1V, there may be more errors of each kind made by the larger population.

Table V11 presents 324 Spelling Errors from Science Papers. The word arrangement and basis of selection is the same as for Table 1V. The frequency column is the same. The "Position" column has rankings from Thorndike's "The Teacher's Word Book" as in Table 1V. Derivatives are treated in the same way. However, certain words not listed in "The Teacher's Word Book" are rated, their rank being marked with brackets. These ratings came from Powers "A Vocabulary of Scientific Terms For High School Students", Teachers College Record Vol. 28, P 220. Powers listed "uncommon" words (not found in "The Teacher's Word Book") found in approximately two million words taken from General Science, Biology, Chemistry and Physics texts; from popular scientific books and miscellaneous material. From these he selected the 1828 "important" words according to his definition. The key to his ranking is as follows:

Frequency	Range of Occurrence.
1 more than 500	a.in 5 sources
2 250---499	b.in 4 sources
3 100---249	c. in 3 sources
4 50---99	d.in 2 sources
5 30---49	e.in 1 source.
6 20---29	
7 10---19	
8 less than 10	

Thus certain words important for the vocabulary of General Science, but not in the more general vocabulary of "The

TABLE VI

66 Repeated Errors in Spelling from Social Studies Papers.

Word (including derivatives)	No. of different spellings.	Total no. of errors	Word (including derivatives)	No. of different spellings	Total no. of errors.
across	3	5	hospital	2	2
afford	2	2	emergency	2	2
apparatus	3	3	library	4	4
apparel	2	4	license	2	2
aeroplane or airplane	5	14	Mediterranean	3	3
assisted	3	3	mechanical	2	2
banana	2	3	Montreal	2	2
benefit	1	5	pasteurized	2	2
Britain	3	4	perforated	2	2
buses	5	5	persevere	2	2
cellulose	2	3	propeller	6	9
cereal	2	2	quarantine	12	13
cheap	2	2	refrigerator	2	3
citie(s) or city	3	7	reforestation	2	2
cloth	2	3	resources	2	2
community	4	4	Roosevelt	3	3
control	1	2	route	1	2
convenience	5	5	sanitorium	1	2
courses	2	2	separator	1	8
destruction	1	2	shipped	1	7
diesel	2	2	skiis	1	7
dyeing	2	2	Stalin	2	2
electricity	3	3	strips	1	2
equipped	1	2	tariffs	2	2
Fascist	5	7	together	2	2
families	2	4	travels	1	3
fertilize	2	2	tuberculosis	2	3
government	2	2	Tweedsmuir	8	8
grocery	2	2	usually	2	3
height	2	2	vacuum	3	9
			valuable	2	2
			Zeppelin	2	2

Teacher's Word Book" are rated. Any word not listed was not found in either of the lists.

Table Vll includes 190 different words misspelled. There are 246 different spellings of these 190 words. Including repetitions there are 324 spelling errors in the list. Twenty seven words were misspelled the same way by two or more students. Five different words were not listed in either list, and including repetitions 11 errors were not listed. Errors in derivatives of root words total 36. Including repetitions 40 errors occurred in derivatives. In tabular form:

	Number of diff. words.	No. diff. spellings	N.L.	Deriv-atives	Power's list
Without repetitions of the same word	190	246	5	36	42
Including the same error repeated once or more times		324	11	40	94

Of the 190 different words 42 occurred in Power's List and not in "The Teacher's Word Book" and of the 324 errors including repetitions, 94 occurred in Power's list and not in "The Teacher's Word Book."

Table Vlll presents for Spelling errors on Science papers what Table V presents for spelling errors on Social Studies papers, and is read in the same way.

Table lX presents the 35 errors in spelling on Science papers made by more than two students. It was compiled and is read like Table Vl.

Table X lists the errors in spelling on Science papers which are taken from the 324 errors of table Vll, and are found in Power's list but not in Thorndike's. These may be

TABLE V11

Spelling Errors from Science Papers.

Word	Frequency	Position	Word	Frequency	Position.
obsurb (absorb)	8		cappillarity		
alowing	63	1b	cappilarity		
alumimun	3				
amont	51	1b	carbon-dioxide	(1)	(b)
			carbondioxide		
aplied	36	2a			
apied (applied)			careing		
applyed			caried		
applys			carrieing		
			carefull	59	1b
appart	39	2a	climbe	47	2a
arme	96	la 3	cieling	14	4b
arround 2	95	la 3	compressability 2	(7)	(c)
atract	17	4a			
acward (awkard)	9		combustable	(5)	(a)
axel 3	8		combustion	(3)	(a)
bannanas	14	4b	comparitively	11	5b
			communicabe	(6)	(c)
barometre 3	(3)	(b)	compossed		
borometer			confection	(4)	(d)
biromator					
biromiter			condensated		
barmometer			(condensed)		
			condences	9	
bear (bare)					
batton (batten)	N.L.	(N.L.)	condensable		
			condenst	9	
bouys	(7)	(a)	controled		
bouyancy 11	(7)	(b)	contuct	34	2b
bwoyancy			continualy		
bouyency			conviction		
boyancy			(convection)	(4)	(d)
boyant	(7)	(c)	conciderable	17	4a
bouyant 2			coolder		
			crackes		
break (brake) 3	23	3a	currant (current)	34	2b
callories	(2)	(a)	dampnes		
canot	70	1b	defected		
			(deflected)	(6)	(c)
cappilary	(3)	(b)	deat (death)	82	la 5
cappillary 2					
capilarity	(5)	(b)	disolves 2	21	3b
			dissolvant		

( ) -- Position in Power's list.

TABLE V11

Spelling Errors from Science Papers.

Word	Frequency	Position.	
distroy		50	1b
diaphram	2	(3)	(a)
doeing			
doe (do)		180	1a 1
easly		31	2b
elts (else)		60	1b
esle (else)			
either (ether)		(3)	(a)
eather (ether)			
electroplateing		(7)	(c)
eighter (eighty)		22	3b
enviroment		(3)	(d)
equiped			
especialy			
evatorates		4	
expance		4	
expandition (expansion)		6	
existance		14	4b
fiction (friction)		(2)	(b)
focust			
focussed			
folcrom	3	(3)	(c)
fore (four		114	1a 2
freez (freeze)		30	2b
galvinizing	6	N.L.	(N.L.)
galvonizing			
gass		23	3a
gouvenours		37	2a
goverment		62	1b
grate (great)		159	1a 1
handes			
handels		43	2a
hight	2	54	1b
hidrolic		(4)	(c)
horizontically		7	
humas	2	(5)	(b)
ignit		(4)	(b)
imflamable		(6)	(b)
inergaic (energetic)		5	
insilation		(7)	(a)
insolation			
enoculate		(4)	(b)
encline		25	3a
isen't		9	
kenetic		(3)	(b)
legumous		(8)	(c)
lessend			
lessons		11	5b
lignt (lined)			
lieing (lying)		37	2a
likly		25	3a
lin (line)		97	1a 3
loose (lose)		63	1b
lossing			
magnatized		(4)	(c)
magnatism		(4)	(b)
makeing			
mane (many)		153	1a 1
mediam		14	4b
median			
medicins			
mettel		32	2b
mettle (metal)			
minuss		4	
mochanical		5	
molecuals		(1a)	
mostioning (motioning)		29	2b
moulten		8	

( ) -- Position in Power's List.

TABLE V11

Spelling Errors from Science Papers.

Word	Frequency	Position.	
necissary		57	1b
negitive		9	
nightrogen		(2)	(a)
nytrogen			
nomber		104	1a 3
numberous		27	3a
obayed		47	2a
obstecles		10	5b
occured			
opposit		34	2b
oppisite			
optomerist		N.L.	(N.L.)
oxegon	2	(a)	(a)
oxegen			
oxegyn			
oxygien			
oxidises		(2)	(a)
oxydizing			
oxodizing			
oxidise			
oxidizantion		(2)	(b)
oxiadation			
parralax		N.L.	(N.L)
particules		8	
pacient (patient)		36	2b
peddle (pedal		4	
permitt		38	2a
photosythis		(4)	(d)
physicial		10	5b
phospherous		5	
plateing		N.L.	(N.L)
pluss		6	
polution			
porclain		7	
posative		13	5a
presser (pressure)		12	5a
presure			
prevelent		(6)	(c)
pund (pound)		60	1b
punnishing			
pupal (pupil)		39	2a
pyrchisis		41	2a
quarenteen		(4)	(c)
quaranteened	4		
quarentined			
quarrentined			
quarrantine			
recieve	2	88	1a 4
refering			
relized		20	3b
releave		25	3a
rences (rinses)			
realitives		23	3a
repell	2	7	
resistence	6	7	
resits (resists)		16	4a
resturaunts		14	4a
rian (rain)		83	1a 5
rick (rich)		90	
wreckless		4	
scold (scald)		5	
seperate		50	1b
sewrage			
shinning	3		
skie (sky)		69	1b
smoth (smooth)		48	2a
spase		50	1b
spoures		(2)	(b)
speacialist		3	
stoping			
stoped	3		
stomates	2	(4)	(a)
strenious		7	
steralized		(4)	(a)

( ) -- Position in Power's list.

TABLE V11 (cont'd)

Spelling Errors from Science Papers.

Word	Frequency	Position.
steaper		
stareway	4	
suportability		
symphothus (synthesis)	(4)	(b)
tabel	90	la 4
taist	53	lb
tendancy	9	
thriew (through)	149	la 2
theourgh (thorough)	33	2b
trafic	16	4a
trangle	9	
travells 9	69	lb
tubercolosis	3	
onless	44	2a
untill 3	108	la 3
unessecary	11	5b
vacum 12	3	
vacuim 2		
vaccuim		
vaccum 10		
vacumm		
vacume		
vacinated	(7)	(d)
vegetabels	30	2b
vegitable		
virticle	8	
vise-versa	(7)	(a)
vitimin		
volcanos	(4)	(b)
weels	53	lb
wether (weather)	60	lb
youre (for your)	159	la 1
No. of words misspelled	190	
No. of diff. spellings without repeats.	246	

Word	Frequency	Position.
No. of diff. spellings with repeats	324	
No. of words misspelled the same way	27	
Not listed, not including repeats, total	5	
Not listed, including repeats, total	11	
Errors due to derivatives of root word, not including repeats.	36	
Errors due to derivatives of root word, including repeats.	40	

( ) -- Position in Power's list.

TABLE VIII

Spelling Errors From Science Papers in the First 5000 of Thorndike's Word List.

Hundred	In 1st Thousand	Frequency		Frequency	In 2nd Thousand	Frequency		Frequency.
3	arm		amount		applied		conduct	
3	around	2	cannot		apart		current	
5	death		careful		bare		easily	
1	do		destroy		climb		freeze	
2	four		else		governor		handle	
1	great		government		lying		metal	
3	lime		height	2	permit		motion	
1	many		lose		pupil		opposite	
3	number		necessary		purchase		patient	
4	receive	2	pound		smooth		thorough	
5	rain		separate		unless		vegetable	
4	rich		sky		11	11		
4	table		space				11	11
2	through		taste					
3	until		travels					
1	your		wheel					
			weather					
	16	18						
			18	19				

In 3rd Thousand	Frequency		Frequency	In 4th Thousand	Frequency		Frequency
brake		dissolves	2	attract		banana	
gas		eighty		considerable		ceiling	
incline		realize		resist		existence	
likely				traffic		medium	
numerous		3	4	4		4 restaurant	
relieve						5	5
relative							
7	7						

In 5th Thousand	Frequency		Frequency
positive		comparative	
pressure		lessen	
		obstacle	
2	2	physical	
		unnecessary	
		5	5

TABLE IX

35 Repeated Errors in Spelling from Science Papers

Word (including derivatives)	No. of different spellings	Total number of errors.
applied	4	4
around	1	2
axle	1	3
barometer	5	7
buoy (ancy)	7	18
capillary	5	6
carbon dioxide	2	2
brake	1	3
combustible	1	2
compressible	1	2
condensed	2	2
dissolve	2	3
else	2	2
focused	2	2
galvanizing	2	7
height	1	2
humus	1	2
insulation	2	2
magnetize	2	2
medium	2	2
metal	2	2
nitrogen	2	2
opposite	2	2
oxygen	4	5
oxidize	6	6
pressure	2	2
quarantine	5	8
receive	1	2
repel	1	2
resistance	1	6
shining	1	3
stopping	2	4
stomata	1	2
vacuum	6	27
vegetable	2	2

considered technical terms, or a scientific vocabulary. The first 25 words are all rated as 4 c or more important; the rest are arranged alphabetically. There are 42 different words and 94 errors in Table X.

Considering the results presented in Tables VIII, IX and X we are now in a position to say how the 324 errors (out of 455 errors on 88 out of 100 Science Papers) are made up. From the 1st 5000 of Thorndike's list: 1st 500-18; 2nd 500-19; 3rd 500-11; 4th 500-11; 5th 500-7; 6th 500-4; 7th 500-4; 8th 500-5; 9th 500-2; 10th 500-5. Total from the 1st 5000 words of Thorndike's list is 85 errors. From the 2nd 5000 words of that list come 91 errors. From Power's list come 94 errors. Not listed, 11 errors. Derivatives, 40 errors. These total 324. It is interesting to note that the number of errors coming from the 2nd 5000 of Thorndike's list is larger than the corresponding number from the 1st 5000. This reverses the corresponding situation in Social Studies. The explanation seems to be that many words which students misspell in Science have a low rating on Thorndike's list. That is, the outer edges of his list contain words seemingly a part of a scientific vocabulary, e.g. vacuum is rated 3 (frequency of 9191 to 10,000) by Thorndike, yet it is an essential word in Science and 27 errors were made on this word alone.

Table XI presents spelling errors on Mathematics papers. The selection, arangement and reading of this table follows that of Table IV. The results for Geometry and Algebra are given separately. There was considerably more written work on the Geometry answer papers than on the Algebra; so more errors are

TABLE X

Errors in Spelling from Science Papers - "Scientific Terms"

Rating	Word	Frequency of error.
1a	molecule	1
1a	oxygen	5
1b	carbon dioxide	1
2a	calorie	1
2a	nitrogen	2
2a	oxidize	4
2b	friction	1
2b	oxidation	2
2b	spore	1
3a	combustion	1
3a	diaphragm	2
3a	ether	2
3b	barometer	7
3b	capillary	3
3b	kinetic	1
3c	fulcrum	1
4a	sterilized	1
4b	ignite	1
4b	inoculate	1
4b	magnetism	1
4b	synthesis	1
4b	vitamin	1
4c	hydraulic	1
4c	magnetise	1
4c	quarantine	8
	25	51

Rating	Word	Frequency of error.
7a	buoy	1
7b	buoyancy	17
5b	capillarity	6
7c	compressible	2
5a	combustibility	2
6c	communicable	1
4d	convection	2
6c	deflected	1
7c	electroplating.	1
5b	humus	2
6b	energetic	1
7a	insulation	2
8c	leguminous	1
4d	photosynthesis	1
6c	prevalent	1
7d	vaccinate	1
7a	vice versa	1
	17	43

listed for Geometry. So many of the errors are technical mathematical terms that rankings are not given.

There are 96 errors from Geometry papers. Thirty-seven different words were misspelled , and of these there were 73 different spellings, i.e. there are 73 words in the list. Twelve words were misspelled the same way by two or more students. On Algebra there are 45 errors. Fourteen different words were misspelled, and of these there were 27 different spellings, i.e. there are 27 different words in the list. Ten different words were misspelled the same way by two or more students. In tabular form:

	No. of diff. words		No. of diff. spellings.		Words misspelled the same way by 2 or more students.	
	Geom.	Algebra	Geom.	Algebra	Geom.	Algebra.
Without repetitions of the same error	37	14	73	27	12	10
Including the same error repeated once or more times.			96	45		

Table XI presents spelling errors from Mathematics papers, being those words which more than one student misspelled.

. It is selected, arranged, and read like Table VI.

Table XII is a tally sheet table for the number of words per paper on 100 Social Studies papers.

The shortest paper had 340 words and the longest 2640 words. The table shows, however, that these are more or less isolated cases. Approximately 68% of all the papers written, range in length from 913 words to 1639 words. There is sufficient evidence here, however, to make necessary a consideration of equalizing

TABLE XI

Errors in Spelling from Mathematics Papers

Word Geometry	Frequency	Word Geometry	Frequency
ad (add)		oppisite	
altetude		parall	
arces		parellel	5
		paralles	
congrent		paralell	
conguerent		parelells	
conguency		parralels	
		parreles	
corollery		parralell	
corsponding		parrallel	6
		parralled	
diference			
differances		paralellegram	
		parelallogram	
dementionons		parrallelogram	
drawen		parrallelogram	3
		parrellogram	
equalateral			
especly		perpendicular	
		positong	
hypotenuese		protracter	
hight			
		quadrateral	
icoscles			
isoceles	4	respectevly	
isocoles		respectivly	
isocles	2		
isocoles		requiriments	2
isocceles		rode (road)	
isosales			
isoseles		similiar	3
isosoles	2		
isosiles		striaght	2
isoslise		staight	
isoscilies			
isoscelese		supplementury	
isoscels			
		thereom	
interesc		theorum	
(intersect)		theorm	2
interial (interior)			
		to-gether	
		transversaal	2
makig		triangls	
		trangular	
neccesarily			
necissarily		verticly	
		No. of words misspelled	37
opposte		" " diff. spellings	
oposit		without repeats	73
		With repeats	96
		No. of words misspelled the same way	12

TABLE XI (cont'd)

Errors in Spelling from Mathematics Papers.

Word	Frequency
Algebra	
agebra	
alegebra	
algrebra	
algerba	4
annualy	2
bettween	
groupe	
hight	4
hieght	3
highth	
hight	
intrest	2
lemgth	
mathametics	
nickles	5
nickeles	
nickls	
payed	
peices	2
peaces	2
perimiter	2
primiter	
primeter	2
perameter	
peremiter	
volum	
yea for year	
No. of words misspelled	14
" of diff. spellings without repeats	27
With repeats	45
No. of words misspelled the same say	10

Analysis: words on which more than one student made an error.

Word	No. of diff. spellings	Total no. of errors
Geometry		
congruent	3	3
difference	2	2
isosceles	14	19
necessarily	2	2
opposite	3	3
parallel	10	19
parallelogram	5	7
perpendicular	1	2
respectively	2	2
requirements	1	2
similar	1	3
straight	2	3
theorem	3	4
transversal	1	2
14	50	73
Algebra		
algebra	4	7
annually	1	2
height	4	9
interest	1	2
nickels	3	7
pieces	2	4
perimeter	5	7
7	20	38

TABLE XII

Length of 100 Social Studies Papers.

Class Interval (number of words)	Frequency (number of papers)
300--399	1
400--499	0
500--599	0
600--699	2
700--799	7
800--899	4
900--999	8
1000--1099	11
1100--1199	7
1200--1299	17
1300--1399	12
1400--1499	5
1500--1599	9
1600--1699	4
1700--1799	4
1800--1899	4
1900--1999	4
2000--2099	0
2100--2199	0
2200--2299	0
2300--2399	0
2400--2499	0
2500--2599	0
2600--2699	1

Arithmetic mean--1276 words. Standard deviation of the mean--363 words.

The number of words on the paper was arrived at as follows:

(1) The average number of words per line was found for 20 lines.

(2) The total number of lines was counted, making allowance for half-lines etc.

(3) The product of (1) and (2) was taken as the total number of words. A check by actual count was made on five papers and the largest error was less than 20 words.

the English mark according to the length of the paper. This matter will be considered again in connection with the results of some correlations.

This chapter has presented the actual frequency of errors and the lengths of the Social Studies papers. Since the actual spelling errors were recorded it was possible to present an exhaustive analysis of actual spelling errors as is found in Tables IV - XI inclusive. The other classes of errors were merely counted, with a few examples being recorded, hence it was impossible to analyze them beyond the factual statement of tables I, II and III. The following chapter is an analysis of the factual material here presented, and discusses all the major classes of errors.

CHAPTER VIII

ANALYSIS AND INTERPRETATION OF RESULTS.

Errors.- From a study of the results as set forth in the tables one can make certain general observations. These are more likely to be reliable for Social Studies since more English was written on Social Studies papers. With that in mind the following analysis of results is presented:

1. Spelling. On the average students misspell 9.7 words per 1276, or roughly one word in 130, in general written material such as is found in Social Studies. However, 15 students out of our sample of 100 misspelled 20 or more words per 1276, or roughly at least one word in 65.

In Science, on the average 4.5 words per paper were misspelled but again 15 students out of our sample of 100 misspelled at least twice as many (9) words per paper.

Thus, on the basis of our sample, 15% of the students misspell at least twice as many words as the average, in Social Studies and Science.

About 1/10 of all the spelling errors in Social Studies were errors in the use of the apostrophe, and about ½ the students in our sample made one or more such error.

Table V shows that 46 errors in spelling were made in the first 500 words of Thorndike's list and 13 in the 10th 500. Students misspell more words which are of common use than those which are frequently used. The correct interpretation of this,

in my opinion, is that the words found at the first of Thorndike's list are used more often by students, hence more errors are made here. The fact still remains, of course, that in general students have not mastered the spelling of these common words. This is something teachers should note. The same interpretation holds for Table VIII.

Tables VI and IX indicate that a number of words are misspelled by a fairly large proportion of students, according to our sample. Considering only those words where the total number of errors was 5 or greater, we may say that at least 5% of Grade IX students misspell the following words: aeroplane (airplane), quarantine, vacuum, propeller, separator, Tweedsmuir, skiis, shipped, Fascist, cities or city, convenience, benefit, across; vacuum, buoy(ancy), quarantine, barometer, galvanizing, capillary, resistance, oxidize, oxygen. It will be noticed that some of these words are repeated indicating that they were misspelled by at least 5% of the students in both Social Studies and Science papers. They are arranged in the above list in order of importance as words which are commonly misspelled.

In Table VII the position is taken from two word lists. From the construction of Thorndike's list, words which are of great importance in a vocabulary of scientific terms appear towards the end. On the other hand no words to be found in Thorndike's list are included in Power's list. Thus Table X does not include all the words of importance

in a list of scientific terms. However, Tables IX and X give an indication of which scientific terms students misspell.

The amount of written material on Mathematics papers was very small, so one must generalize cautiously. According to the results from our sample, we may say that at least 5% of the students in Grade IX misspell these words: isosceles, parallel, height, perimeter, nickels, algebra, parallelogram.

2. Capitalization and Punctuation. The results from Science and Mathematics depended too largely on the form of the questions to draw any inferences from them. In Social Studies it is safe to say that most students are careless about beginning a sentence with a capital letter and ending it with a period. When writing an examination students are under pressure for time and such errors may be, I believe, safely attributed to carelessness. More serious is the inference that about 50% and 25% of Grade IX students make one or more other errors in use of the capital and period respectively.

A safe inference is that all students make some error in the use of the comma. Furthermore, the total number of such errors averages about 7 per student in 1276 words.

About 35% of the students in Grade IX, on the basis of our sample, omit the colon where it should be included. In general one may say that Grade IX students have not

mastered the use of the colon.

3. Word Usage. In general one can safely say that, according to our sample, at least 15% of the students in Grade IX make one or more errors in homonyms.

All students, according to our sample, make one or more errors in general word usage, the average being 6.6 in the case of Social Studies where each student wrote on the average of 1276 words. In general one may expect, on the average, that a Grade IX student will make at least one such error on each page of standard-size foolscap.

Of the homonyms, "two, to and too; there for their" cause the most errors.

4. Grammar. According to our sample 45% of the students in Grade IX will make errors of the "if-----was" kind in the use of the subjunctive.

The most serious error is the use of a subordinate clause as a sentence. According to our sample 62% of the students in Grade IX make one or more such error and 16% will use a phrase as a sentence. Combining these two we find 67% of the students in Grade IX will use a clause or phrase as a sentence. This indicates a lamentable lack of "sentence sense".

On the basis of our sample 55% of Grade IX students make one or more errors in verb and subject agreement and 38% make some other mistake in the use of the verb. Combining these two we find that 63% of the students in Grade IX make

one or more such error and 16% will use a phrase as a sentence. Combining these two we find 67% of the students in Grade IX will use a clause or phrase as a sentence. This indicates a lamentable lack of "sentence sense".

On the basis of our sample 55% of Grade IX students make one or more errors in verb and subject agreement and 38% make some other mistake in the use of the verb. Combining these two we find that 63% of the students in Grade IX make some error in the use of the verb.

5. Sentence Structure.- One of the most serious errors is the run-on sentence. Combining the results presented in Table 1 we find that, according to our sample, 83% of the students in Grade IX make one or more such errors. The total for the 83 papers is 275 errors.

Another serious error is wrong word order. 45% of Grade IX students, according to our results, make such errors.

Indefinite pronoun reference and ambiguity of modifiers cause errors for 62% of Grade IX students according to our sample.

Eighty per cent of Grade IX students add or omit important words, according to our sample. Another error which is annoying to the reader is made by 50% of the students--an article omitted.

Finally our sample shows that 27% of Grade IX students use one or more "clumsy" sentences--a very serious error.

Summarizing the above analysis, and listing the classes of errors from the point of view of seriousness as errors and

frequency, the following list is obtained:

1. Spelling.
2. Capital omitted or used when not required.
3. Period omitted.
4. Comma omitted
5. Colon omitted.
6. Homonyms.
7. General word usage (slang, adjectives for adverbs, improper compounds etc.)
8. If-----was construction.
9. Fragment (subordinate clause or phrase) used as a sentence)
10. Verb and subject agreement.
11. Run-on sentences.
12. Wrong word order.
13. Ambiguity of modifiers.
14. Important words added or omitted.
15. Clumsy sentences.

On considering their seriousness as errors--i.e. the extent to which they destroy the clarity of the meaning--those marked ## are in my opinion the worst offenders. Those marked # often may be. Of course nearly all errors do to some extent destroy the clarity of the meaning, even if for no other reason than that they distract the reader's attention from the material at hand.

Classification Scheme.- In general the classification scheme adopted will cover all the most serious errors made by students in Grade IX. A few improvements were discovered as it was being used. No doubt errors in case (nominative-objective) should have been included as a sub-heading under grammar. The possessive case is listed under errors in the use of the apostrophe. General word usage might be more clearly defined either by examples or sub-headings, or in a guide sheet. Beyond this any attempt to make the classification scheme more exact will make it more complex, which is to be avoided.

Some errors are difficult to classify. General word usage and spelling are easily confused. On the whole, the more errors there are in any one sentence the greater the difficulty in classifying them. The use of the class "clumsy sentence" reduces the danger of "shifting" in my opinion. My experience is that one can readily become proficient and consistent in the use of the classification scheme.

Weighting.- The weights chosen were somewhat arbitrary and may be altered, but in general an analysis of the results leads to the following considerations: One error in each class may be purely carelessness, while more than one probably shows a weakness in the student's habitual use of English. For example, Table 111 shows that some students make five or six times as many errors as others. This must show definite weakness in the use of the mechanics of English as against a possible "slip"--carelessness or the like. These considerations suggest a revision of the weighting system somewhat as follows:

	Deduction
1st error	X
2nd error	X and a
3rd error	X and b
4th error	X and c

where a,b, and c are increasing numbers. Thus the deductions for errors in Spelling on Social Studies might be: Spelling: Max. ded. 13/100 Weight--1,2,2,2,3,3. The first error would count one mark off, the second two, and so on. This would constitute an improvement in the weighting system, in my opinion.

The Kind of Examination Set and English marking.- It has been mentioned before that only the results in spelling can be re-

lied on, from Mathematics and Science papers. Considering the Science paper, as already noted, on many questions the answer might be a phrase or a full sentence, and the candidate must guess which to use. The amount of written essay material was far too small to adequately gauge the English usage.

It was possible to mark English on the Geometry paper. There is however, little essay-type English used here. Fragments for sentences are common.

It was foolish to attempt to mark English on the answer papers in Algebra. For example, one candidate had three written words on his paper, as follows: "algebra", the title on each of two pages, and "12 inches".

Obviously, if the English used is to be marked on a content course, this must be considered in deciding on the form of the examination paper. Where a blank is to be filled, as in the Science paper, the candidate should be instructed whether he is to use a phrase, clause or complete sentence. However, except for spelling, word usage and possibly grammar, the essay type answer is the only one adapted to testing the student's habitual use of English.

Variations in the Length of the Paper and English marking.- As shown in Table XII the length of papers (Social Studies) varies considerably. One may consider either:

(1) The student has submitted so much material on which the English is to be marked.

or (2) The opportunity for making errors varies with the length of the paper and some equalization should be made when

the lengths vary widely.

The evidence from correlations 11 and 12 (Table XIII) supports #2 above. There is a correspondence, even if low, between the length of the paper and the number of errors. It is significant that in the case of my weighted marking of errors the correlation is higher than for the corresponding marking by the Department. Correlation #10 shows a fair degree of relation between the length of the paper and content mark. The decision about equalizing the length of the part marked or not depends on the purpose of marking English. If the mark is to be incorporated into the raw score for Social Studies and added to the marks from other subjects to make a total raw score, then perhaps it is not necessary to attempt any equalization of length. In general the mark for Social Studies is greater on the longer papers and the mark for English less. Thus one may argue that in general students who had to be verbose in order to gain more content marks deservedly lose marks for English. For the exceptions justice seems automatic. The long paper with few deductions for English deserves more marks; the short paper with a high content mark deserves the reward for being succinct. The administrative purpose described above can well be served without any equalization for length of papers.

If the English mark is desired in itself, or to be used in determining the student's ability in English usage, then some equalization must be effected. From the point of view

of English alone it is obviously unfair to mark one student for mechanical errors on 340 written words and another on 2640 words. The results of the correlations cited indicate that the more written material the greater the opportunity for errors. Equalization may be effected by two methods or a combination of them:

1. Mark the English on only (say) three full foolscap sheets. Nearly all students write this much. Of course an estimate of the number of written words would be more accurate, but much more laborious. It is doubtful whether a word-count would be worthwhile.

2. Multiply the mark for English on the shorter papers by a given factor and divide those of the longer ones by a similar factor.

The disadvantage of Method #1 is that in general the smaller the sample the less reliable is the knowledge of any student's habitual use of the mechanics of English. Thus by reducing the sample down to one page the results are no longer suitable for individual diagnosis (cf. correlations #13 and #14) In the case of Method #2 technical difficulties appear. What factor? How obtained? When applied? One suggestion is to bring all papers to an average length (actually 1276 words). Thus the deduction for English on the 340 word paper can be multiplied by 4, since this paper is approximately $\frac{1}{4}$ as long as the average; while the deduction for English on the 2640 word paper could be divided by 2, since this paper is approximately twice as long as the average. Such a rough system

might work quite well, on the assumption that the student has presented a representative sample of his "English in use". The longer papers might be at a disadvantage since fatigue would enter as a factor. The disadvantage of the above-described method is that it involves a count or estimate of the number of words on the paper.

The Use of One Page for English marking.- One suggested method of marking the English on content courses was to select one full page of written material and use that as a sample of the student's English usage. This proposal was to be tested by this study. Correlations #13 and #14 (Table XIII) give some evidence on this matter. Such results indicate that one sheet is not a sufficiently reliable sample of a student's usage on the whole paper, to permit the results being used for individual diagnosis. What is required is that the one page selected be a representative page. The theory of sampling indicates that merely selecting a full page would not likely give this desired result. At all events, when done in this study for 100 papers the results were as indicated by correlations #13 and #14 i.e. r=0.53 and 0.49. We must reject this proposal on the basis of this evidence.

Correlations.- Table XIII presents a number of correlations, which in general (numbers 1-9 inclusive) show a mild degree of relationship between the various marks in English. A reference to the Department's English (language) test in Appendix 1 will make clear the nature of the questions mentioned (1-5 and number 6)

TABLE XIII

CORRELATIONS (PEARSON PRODUCT-MOMENT)

Variables	Value of r	Standard Error in r
1. Dept's objective English (questions 1-5) vs. Dept's English essay (question 6)	0.49	0.08
2. Dept's objective English (questions 1-5) vs Dept's English on Social Studies.	0.41	0.08
3. Dept's English essay (question 6) vs. Dept's English on Social Studies.	0.21	0.10
4. Dept's Objective English (questions 1-5) vs. my English on Social Studies.	0.35	0.09
5. Dept's English Essay (question 6) vs. my English on Social Studies.	0.27	0.09
6. Dept's objective English (questions 1-5) vs. Dept's English on Science.	0.48	0.08
7. Dept's objective English (questions 1-5) vs. my English on Science.	0.56	0.07
8. Dept's objective English (questions 1-5) vs. Dept's English on Geometry.	0.27	0.09
9. Dept's objective English (questions 1-5) vs. my English on Geometry.	0.33	0.09
10. Length of S.S. paper vs. Dept's mark on S.S.	0.54	0.07
11. Length of S.S. paper vs. Dept's English on S.S.	-0.19	0.07
12. Length of S.S. paper vs. my English on S.S. (Length means number of written words)	-0.24	0.09
13. My Eng. on S.S. for all the paper vs. my Eng. for S.S. on one complete page of the same paper.	0.53	0.07
14. Total number of errors on each S.S. paper vs. total number of errors on one page of the same paper (in #13 and #14 the one page was included in the complete paper)	r = 0.49	0.08

Correlation #1 shows a mild relationship between the "objective" and "essay" part of the Department's English examination. Numbers 2,3,4 and 5 show in general that the "objective" portion of the Department's English examination has a higher degree of relationship to the mark assigned for mechanical errors on Social Studies than the "essay" portion of the same examination has. The difference is not, however, great. Comparing the results from numbers 2,3,4 and 5 with 8 and 9, evidence is here given that the amount of English written on Geometry papers, and/or the kind, is not as suitable to sample the student's English usage as the longer essay-type Social Studies papers. On the other hand, comparing the results of numbers 2,3,4 and 5 with 6 and 7, such conclusions do not hold of this Science paper. In general no definite conclusions can be drawn from the results given in Table XIII. A mild type of evidence, is however, offered. The two negative coefficients (numbers 11 and 12) are significant, but are discussed elsewhere.

CHAPTER IX

CONCLUSIONS, RECOMMENDATIONS, AND SUGGESTIONS FOR FURTHER STUDY

Conclusions.-1. It is possible to devise a simple, usable weighted marking scheme, as is here presented. The use of such a scheme should make the marking of mechanical errors by markers more consistent than it would be without its use.

2. The use of this scheme presents a simple method of obtaining a record of the number and kind of mechanical errors made by students. Such results are presented in the body of this work.

3. Students at the end of Grade IX in Alberta Intermediate Schools in general make a few common types of errors.

4. The kind of examination paper set determines to a great extent the suitability of the answer papers for gauging the student's English usage. The essay type answer is most suitable for this purpose.

Recommendations.-1. It is inadvisable to use a small sample such as one page for marking mechanical errors in English.

2. The administrative purposes to which the mark for English is used determines whether there should be equalization of lengths of papers. If the mark is to be used absolutely as a gauge of the student's habitual English usage then there should be equalization.

3. For actual use the weighted marking scheme can be arranged as follows: (this scheme embodies various suggested improvements)

A Weighted Marking Scheme.-

Instructions: Starting at the left stroke out one figure under the deduction column for each error found. When the total deduction under any major class reaches the maximum deduction for that class; pay no attention to further errors in that class. Compute the total deduction for all classes, subtract it from 100, thus leaving the percentage mark for errors in the mechanics of English.

Major Class	Max. Ded.	Deduction for each error	TOTAL DED.
Spelling (with apostrophe)	13	122233	_____
Capitalization and Punct.	12		
Capital omitted at the beginning of a sentence		22334	
Other errors in the use of the capital		22233	
Comma omitted. A: To separate words in a series		112233	
B: To show a change of thought		112233	
C: To set off an interruption		112233	
Period omitted at end of a sentence		122233	
Other errors in the use of the period		122233	
Miscellaneous (use judgment)		12345	_____
Word Usage	13		
Homonyms (to, too, two; their, there; of, off		3344	
General (slang, improper compounds, improprieties adverb for adjective, etc.)		1122223	_____
Grammar	20		
Agreement of verb and subject, antecedent & relative		33445	
Other errors in the use of the verb		333444	
Subordinate clause or phrase used as a sentence		579	
Miscellaneous (Wrong case forms etc. Use judgment)		234567	_____
Sentence Structure	42		
What should properly have been two or more sentences strung into one by "and", "so", commas, etc		5566778	
Clumsy sentences		10,10,15,15	
Misplaced modifiers, ambiguity of modifiers, indefinite "it", indefinite reference of pronouns		5578,10,10	
Important words added or omitted		33557799	
Miscellaneous (use judgment)		233445566	_____
		Total Deduction	

Suggestions for Further Study.- 1. Using the marking scheme here presented a test of consistency could be made by having one or more markers mark a set of (say) 100 papers. After the lapse of a certain time they could re-mark the same papers. A correlation of the marks given would indicate how consistently the scheme can be used.

A variation of the above procedure would indicate the amount and kind of shifting which may occur.

A study of the sheets used would show to what extent errors occur in each class, and how frequently the total deduction for each class is made.

2. An error count to obtain the "Social Utility" of various errors could be made. This involves the counting of correct constructions and errors in the same kind of construction. Such an index would be the best basis for weighting.(cf. P. 24)

APPENDIX 1

Nº 6693

HIGH SCHOOL ENTRANCE EXAMINATION BOARD

DEPARTMENTAL EXAMINATIONS, 1937

GRADE IX

ENGLISH

Language

Time—1½ hours.

Values

5 **1.** In the spaces provided at the right, indicate by letter *a* or *b*, the correct spelling of the following words. The first one is done correctly.

	(*a*) streem	(*b*) stream	.....*b*.....
1.	(*a*) seperate	(*b*) separate	.....
2.	(*a*) forty	(*b*) fourty	.....
3.	(*a*) likeable	(*b*) likable	.....
4.	(*a*) occured	(*b*) occurred	.....
5.	(*a*) journeys	(*b*) journies	.....
6.	(*a*) Negros	(*b*) Negroes	.....
7.	(*a*) ponies	(*b*) ponys	.....
8.	(*a*) exercise	(*b*) exercize	.....
9.	(*a*) athalete	(*b*) athlete	.....
10.	(*a*) succeed	(*b*) succede	.....
11.	(*a*) recede	(*b*) receed	.....
12.	(*a*) receive	(*b*) recieve	.....
13.	(*a*) beleive	(*b*) believe	.....
14.	(*a*) ommited	(*b*) omitted	.....
15.	(*a*) offerred	(*b*) offered	.....

Values

16. (*a*) burgular (*b*) burglar .....

17. (*a*) privilege (*b*) privelege .....

18. (*a*) buisness (*b*) business .....

19. (*a*) tendency (*b*) tendancy .....

20. (*a*) useing (*b*) using .....

R..... W..... U.....
(For the use of the sub-examiner only.)

10 **2.** In the spaces provided at the right, indicate by letter, *a*, *b* or *c*, the word which correctly completes each sentence below. The first one is correctly done for you.

We (*a*) *seen* (*b*) *saw* him today. .....*b*.....

1. Can you tell who (*a*) *done* (*b*) *did* it? .....
2. (*a*) *Who* (*b*) *Whom* do you think took it? .....
3. He is as tall as (*a*) *me* (*b*) *I*. .....
4. When (*a*) *were* (*b*) *we're* they going to leave? .....
5. We hear (*a*) *it's* (*b*) *its* coming soon. .....
6. Some of (*a*) *us* (*b*) *we* boys are going. .....
7. I am going to ask if I (*a*) *may* (*b*) *can* go. .....
8. My book has (*a*) *laid* (*b*) *lain* on the desk all day. .....
9. Neither of the boys (*a*) *was* (*b*) *were* there. .....
10. (*a*) *Lie* (*b*) *Lay* still until you feel better. .....
11. She (*a*) *set* (*b*) *sat* there, listening to the music.
12. He divided his money (*a*) *between* (*b*) *among* his four brothers. .....
13. Let us (*a*) *sit* (*b*) *set* the lamp on the shelf. .....
14. It was (*a*) *they* (*b*) *them* who heard it first. .....

APPENDIX 1

Values

15. I (*a*) *shall* (*b*) *will* go in spite of them. .....

16. Of the two boys he is the (*a*) *tallest* (*b*) *taller*. .....

17. Fred passed the ball (*a*) *quick* (*b*) *quickly*. .....

18. Gardening is (*a*) *healthy* (*b*) *healthful* occupation. .....

19. We were late in coming, (*a*) *due* (*b*) *owing* to the bad roads. .....

20. If anyone knows, let (*a*) *him* (*b*) *them* speak now. .....

21. You and (*a*) *her* (*b*) *she* will be responsible. .....

22. They must have seen you and (*a*) *her* (*b*) *she*. .....

23. We do not wear (*a*) *these* (*b*) *this* kind of shoes. .....

24. I cannot say (*a*) *as* (*b*) *that* I do. .....

25. He is angry (*a*) *with* (*b*) *at* me. .....

26. He is averse (*a*) *from* (*b*) *to* going to the fair. .....

27. The girl (*a*) *who* (*b*) *whom* was elected was absent. .....

28. This coat is quite different (*a*) *from* (*b*) *to* (*c*) *than* mine. .....

29. Shall I cut the cake (*a*) *in* (*b*) *into* four pieces? .....

30. I shall borrow a pencil (*a*) *from* (*b*) *of* (*c*) *off* Jim. .....

31. Should this be compared (*a*) *to* (*b*) *with* that? .....

32. I differ (*a*) *with* (*b*) *from* him in weight. .....

33. If I (*a*) *were* (*b*) *was* you, I should not go. .....

34. It was eight days ago (*a*) *that* (*b*) *since* he left. .....

35. The grass grew (*a*) *luxuriously* (*b*) *luxuriantly*. .....

36. Every one started smoking (*a*) *their* (*b*) *his* pipe. .....

[OVER]

Values

37. We depended upon (*a*) *his* (*b*) *him* coming to help us. .....

38. The hail did not (*a*) *affect* (*b*) *effect* the crops. .....

39. I shall (*a*) *learn* (*b*) *teach* him how to shoot. .....

40. The newspapers sought to destroy his (*a*) *reputation* (*b*) *character.* .....

R..... W..... U.....

5 **3.** In the spaces provided at the right, indicate by letter, *a* or *b*, the correct pronunciation of the following words. The first one is correctly done for you.

	cigar	(*a*) si-gar′	(*b*) sē′gar	.....*a*.....
1.	Tuesday	(*a*) tooz′dā	(*b*) tūz′dā	.....
2.	deaf	(*a*) dēf	(*b*) dĕf	.....
3.	regular	(*a*) reg′lar	(*b*) reg′ū-lar	.....
4.	Wednesday	(*a*) wenz′dā	(*b*) wed′ens-dā	.....
5.	Arctic	(*a*) ar′tik	(*b*) ark′tik	.....
6.	sergeant	(*a*) sar′jent	(*b*) sur′jent	.....
7.	column	(*a*) kol′ūm	(*b*) kol′ŭm	.....
8.	corollary	(*a*) kor′-o-la-ri	(*b*) kor-ol′ari	.....
9.	adult	(*a*) a′dult	(*b*) a-dult′	.....
10.	suite	(*a*) swēt	(*b*) sūt	.....
11.	victuals	(*a*) vic′tūls	(*b*) vit′ls	.....
12.	alias	(*a*) ā′li-as	(*b*) ă′li-as	.....
13.	theatre	(*a*) thē-ā′tr	(*b*) thē′atr	.....
14.	route	(*a*) rout	(*b*) rōōt	.....
15.	exquisite	(*a*) eks′kwi-zit	(*b*) eks-kwi′zit	.....
16.	penalize	(*a*) pē′nal-īz	(*b*) pen′a-līz	.....
17.	Danish	(*a*) dān′ish	(*b*) dăn′ish	.....
18.	genuine	(*a*) jen′ū-īn	(*b*) jen′ū-ĭn	.....
19.	library	(*a*) lī′brā-ri	(*b*) lī′bā-ri	.....
20.	February	(*a*) feb′ū-ary	(*b*) feb′rōō-ary	.....

R..... W..... U.....

APPENDIX 1

Values

2 **4.** Rewrite the following sentences as direct narration:

(*a*) The teacher told Tom that he might go.

.....

.....

(*b*) Doris, stopping suddenly, exclaimed that she had forgotten her key.

.....

.....

.....

Rewrite the following sentences as indirect narration:

(*a*) "If it rains," said Mary, "do not expect me."

.....

.....

(*b*) "Thank you, kindly," she said to him, "for all the favors you have done me."

.....

.....

.....

10 **5.** One of the following eleven sentences is correct. Each of the others contains a mistake which is named in the following list:

(1) unrelated ideas.

(2) unrelated participle.

(3) change of construction.

(4) tagging phrase or clause.

(5) unrelated "which".

(6) incorrect use of conjunction.

(7) ambiguous modifier.

In the spaces provided after each sentence:

(1) state what the mistake is, and
(2) rewrite the sentence in correct form.

[OVER]

Values

(*a*) I have never been so badly shaken, and are my bones sore?

(1) .....

(2) .....

.....

(*b*) Unlocking the cupboard door, a mouse ran out.

(1) .....

(2) .....

.....

(*c*) I do not know, thus I cannot say.

(1) .....

(2) .....

.....

(*d*) He forgot his cap, which made him catch cold.

(1) .....

(2) .....

.....

(*e*) She saw that she had missed her train with disappointment.

(1) .....

(2) .....

.....

(*f*) Each speaker will take a worth-while topic and speak for five minutes.

(1) .....

(2) .....

.....

APPENDIX 1

Values

(*g*) Every year has seen a change of style since 1918.

(1) .....

(2) .....

.....

(*h*) I have hurt my finger which mother told me to avoid.

(1) .....

(2) .....

.....

(*i*) John played a good game after all in many ways.

(1) .....

(2) .....

.....

(*j*) Fred was ill for three days and his sister has a new dress.

(1) .....

(2) .....

.....

(*k*) Coming out of school, the house was seen in the distance.

(1) .....

(2) .....

.....

18 **6.** Write a composition (of about 150 words) on *one* of the subjects suggested below:

(*a*) Autobiography of a foot-bridge, a bit of drift-wood, an Indian arrowhead, a muskrat, or other object or animal.
(*b*) A very wet day.
(*c*) A dust-storm on the prairie.
(*d*) My favorite character in fiction.
(*e*) My favorite character in history.

50

APPENDIX 1

№ 6699

HIGH SCHOOL ENTRANCE EXAMINATION BOARD

DEPARTMENTAL EXAMINATIONS, 1937

GRADE IX

SOCIAL STUDIES

Time—2½ hours.

Note—1. The values on this paper are not based on a total mark of 100. The success of your efforts will depend on the *total number* of marks you can secure.

2. You may not be able to answer all the questions on this paper. You will be able to answer some questions completely and parts of all the others. Answer *first* the questions you like best, and *continue to work steadily at the others* during the time allowed.

Values

1. On the outline map of the world:

4 (*a*) Indicate, by shading, the most densely populated regions of the earth.

5 (*b*) Mark the following cities. Use the number instead of the name.

(1) Ottawa	(6) Moscow
(2) New York	(7) Madrid
(3) Buenos Aires	(8) Rome
(4) Manchester	(9) Addis Ababa
(5) Berlin	(10) Bombay

5 (*c*) Indicate the following:

(1) A country which in 1937 suffered from civil war. (Mark it CW.)
(2) A region recently devastated by great floods. (Mark it GF.)
(3) A region of mining activity in Northern Canada. (Mark it MA.)
(4) A cotton-growing area in North America. (Mark it CGA.)
(5) The country which dominates Eastern Asia. (Mark it DEA.)

10 **2.** Ordinary people have learned that many good things are gained by communities that organize to provide public services. Write a paragraph to show how a family living in a rural home enjoys many benefits of community co-operation. (Remember that a community may be anything from a nation to a school district.)

3. It is often said that "the world grows smaller every day."

2 What do you think this means?

10 Mention *five* scientific or mechanical inventions and explain, briefly, how each illustrates the meaning of this statement.

6 **4.** Has the average city family any advantages over the average rural family in respect to (a) health, (b) recreation, and (c) domestic conveniences? Give your reasons.

8 **5.** Write a paragraph explaining how the isolation of rural homes is overcome by modern inventions and enterprises.

6 **6.** If you were a wealthy farmer located twenty miles from town, what uses would you make of an electrical power plant?

6 **7.** In what ways should a Public Health Board promote the welfare of the people?

Values

5 **8.** The regions named below are exporters of foods for the civilized world. Name *one* foodstuff exported by each:
(Answer in this way: (1)—Coffee.)

(1) Brazil	(7) New Zealand
(2) China	(8) Newfoundland
(3) California	(9) Italy
(4) Argentina	(10) Denmark
(5) West Indies	(11) Algeria.
(6) Alberta	

8 **9.** Write a paragraph about the following statement:
Animals are more useful than vegetables in supplying human clothing.

2 **10.** (*a*) What is rayon?

3 (*b*) How is it made?

2 (*c*) For what is it used?

4 (*d*) What effects has the invention of rayon had upon other industries?

6 **11.** What is meant by *conserving natural resources*? In your explanation refer to timber, natural gas and farm land.

12. Select *one* of the following: tea, sugar, coffee or rice. Tell briefly:

3 (*a*) About the plant from which it is produced and where it is grown.

1 (*b*) Method of packing for shipment.

1 (*c*) One great city of export.

2 (*d*) One route by which it comes to Alberta.

5 **13.** In what respect has artificial refrigeration assisted world trade?

4 **14.** What is the "snowmobile"? Explain how *three* other modes of transportation have been adapted in designing it.

6 **15.** Match the two lists which follow, placing the number of the thing in the second list opposite the name of the man who invented or developed it; for example: McCormick—(13).

McCormick	(1) telephone
Dunlop	(2) fine pottery
Marconi	(3) pneumatic tires
Stephenson	(4) Marquis wheat
Saunders	(5) the photograph
Burbank	(6) locomotive steam engine
Daguerre	(7) sewing machine
Edison	(8) wireless telegraph
Josiah Wedgwod	(9) electric light
Lord Kelvin	(10) new varieties of plants
Bell	(11) smallpox vaccine
Elias Howe	(12) submarine cable
Jenner	(13) mechanical reaper

10 **16.** John Doe, proprietor of the great John Doe Department Stores, addressed a banquet of his employees recently, and said: "I'm a self-made man. I don't need, and I don't want any government help to make a success of my business. I can get along without it."
Give *five* good reasons to show that his statement was untrue.

10 **17.** In a column write down the letters (a) to (i). Opposite each letter write the word or words to complete accurately each sentence.

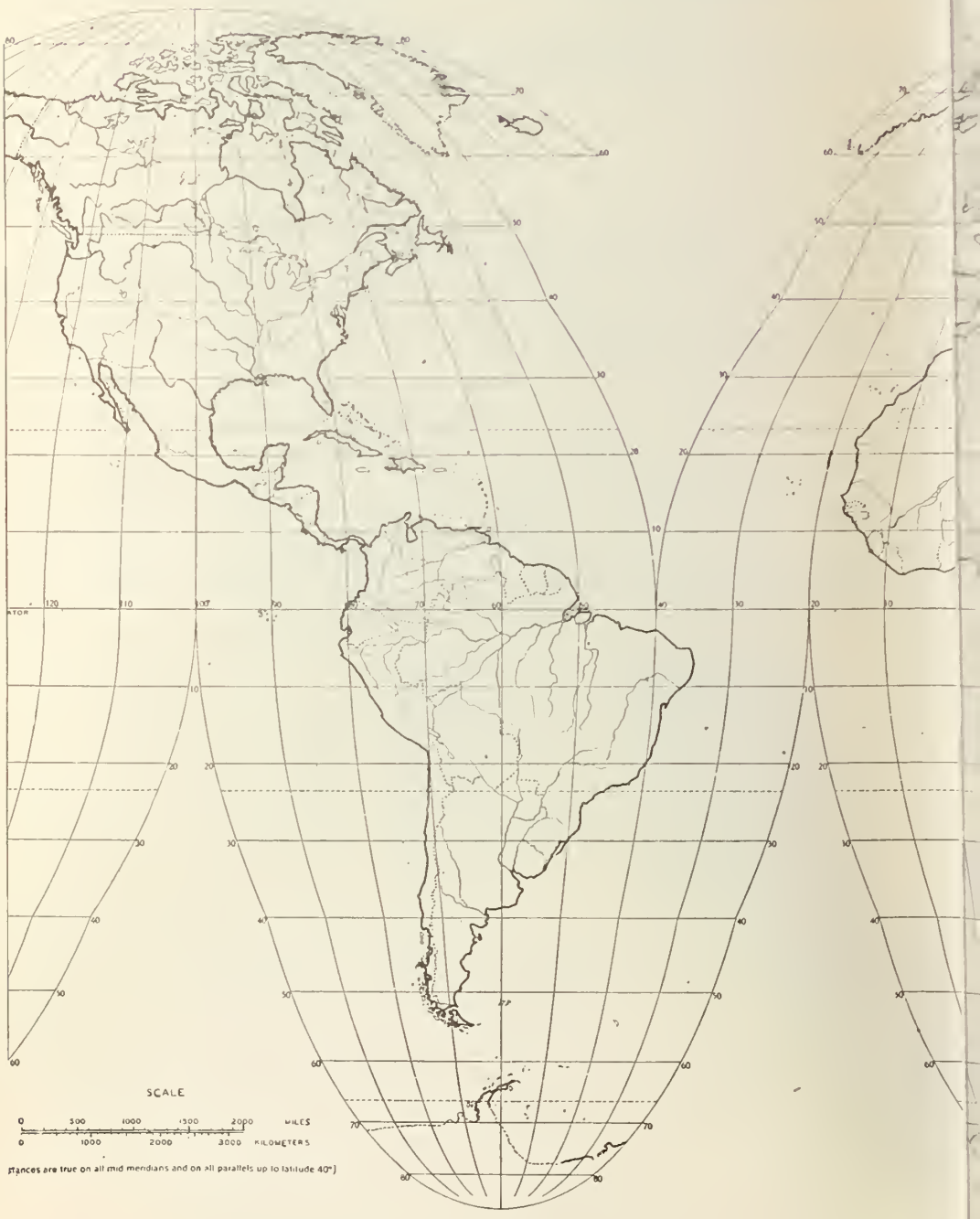
(*a*) The first representative Parliament in England was called together by .....

(*b*) Ministers of the Crown are chosen by the ..... from among .....

(*c*) The Parliament Act of 1911 limited the power of .....

(*d*) The grievances of the Reformers in Upper and Lower Canada were investigated in 1838 by .....

Use this map for Question 1. Be sure to enclose this sheet in your answer



ver envelope.

Values

(*e*) A system of government in which the Cabinet must justify its actions to the elected representatives of the people is called ..... government.

(*f*) The respective powers of the Dominion and Provincial Governments are defined by the .....

(*g*) Alberta has been a province for ..... years.

(*h*) The representative of King George VI in Canada is .....

(*i*) The official party not in power in any Parliament is called .....

8 **18.** Write a paragraph about *one* of the following:

The Nazi Movement
Fascism
Russian Communism
The New Deal

10 **19.** Write brief notes on any *five* of the following:

The Popular Front
Governor Landon
Manchukuo
Anthony Eden
The Rhineland
General Franco
Geneva
Herman Goering
Nicolai Lenin

20. Criticize each of the following statements and try to point out what is wrong or foolish about it.

4 (*a*) The $80,000,000 which Alberta citizens pay annually in license fees for passenger cars alone is enough to wipe out the Provincial Debt three times over.

4 (*b*) Canada needs three million new homes; the first duty of our Provincial Government is to make plans to provide them.

4 (*c*) If we used Alberta hides in Alberta factories to make shoes for Alberta people, we could give employment to 30,000 workers.

21. State *one* important result which might be expected to follow the events suggested below:

2 (*a*) The breeding of a new wheat which ripens ten days earlier than the strains now in use.

2 (*b*) Mass production of an aeroplane that can make vertical ascents and landings at low speed.

2 (*c*) An increase of 100% in the water rates of a large city.

2 (*d*) Reforestation of the mountain region of the Ohio River Basin.

2 (*e*) A 50% reduction in the cost of rural electric power service.

6 **22.** Answer *one* of the following:

(*a*) Bauxite, the ore of aluminum, is shipped from South America to Northern Quebec, and there manufactured into ingots. Explain why this is commercially profitable.

(*b*) Three famous firms manufacturing breakfast cereals have their plants in Southern Ontario. Why is this an advantageous location?

(*c*) There is a pottery industry at Medicine Hat. What are the advantages and disadvantages of this location?

180

[OVER]

After answering questions on page 3, detach the map and place in your answer envelope.

Nº 13823

HIGH SCHOOL ENTRANCE EXAMINATION BOARD

DEPARTMENTAL EXAMINATIONS, 1937

GRADE IX

MATHEMATICS

ALGEBRA

Time: $1\frac{1}{2}$ hours.

Graph paper will be supplied by the presiding examiner.

PART A

Values

1. Simplify each of the following:

1 (*a*) $(3\frac{1}{4})^2$.

1 (*b*) $15xy \div \frac{1}{3}y$

2 (*c*) $\dfrac{2b+30}{8b+60} \times \dfrac{4b}{5}$.

2. Perform the indicated operations:

1 (*a*) $(x^3-2x^2+4x-3) - (3x^3-5x^2+7x+4)$

2 (*b*) $(2x^2-9y^2) \times (2x^2+9y^2)$

2 (*c*) $(4m^2+2mn+n^2) \times (2m-n)$

2 (*d*) $(x^3-18x+30) \div (x+5)$

1 (*e*) $(-mn^2)(-3md)(-2nd^3)$

3 **3.** I bought a house worth \$D. I borrowed the money to buy the house and paid 6% per year for the money. How much interest did I pay per month?

PART B

4 **4.** Write in algebraic symbols:

(*a*) The square of a binomial.

(*b*) The sum of the squares of two numbers.

(*c*) A polynomial consisting of three terms.

(*d*) A monomial with three factors.

[OVER]

Values

2 **5.** A room is b feet long, c feet wide and d feet high. The rule for finding the area (A sq. ft.) of the walls is "Find the product of the perimeter and the height". Write the formula for the wall area.

6 **6.** Solve, including verification:

(*a*) $h(3h - 1) - (3h - 2) = 3(h^2 - 2)$.

(*b*) $\frac{5n}{3} - \frac{3}{4} = \frac{n}{12} + 4$

8 **7.** Long cylindrical steel bars having a $\frac{1}{2}$-inch radius (r) are cut into pieces varying in length (h) from 3 inches to 12 inches.

(*a*) Construct a graph by which you may find the approximate volume (v) of any one of these small cylinders.

($v = \pi r^2 h$, $\pi = \frac{22}{7}$)

(*b*) Read from the graph the approximate length of the bar that has a volume of 5 cu. in.

3 **8.** The perimeter of a square is $(2x + 10)$ feet. Find the area of the square.

7 **9.** *Either* { Frank had \$4.05 in 10-cent and 5-cent pieces. If he had 49 coins in all, how many of each kind did he have?

Or { A merchant mixes 24 pounds of 55-cent tea with such an amount of 45-cent tea that the mixture is worth 48 cents a pound. How many pounds of the 45-cent tea did he use?

№ 13956

HIGH SCHOOL ENTRANCE EXAMINATION BOARD

DEPARTMENTAL EXAMINATIONS, 1937

GRADE IX

MATHEMATICS

GEOMETRY

Time—1½ hours.

PART A

Values

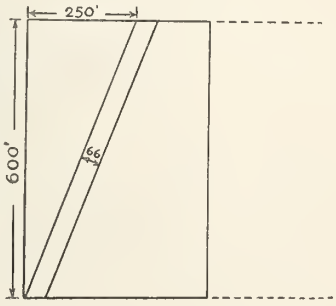
4 **1.** (*a*) The vertical angle of an isosceles triangle is 20°. Draw the triangle.

(*b*) How many triangles meeting these requirements may be drawn? Explain.

2 **2.** Two triangles are similar. The sides of one triangle are 10″, 8″ and 7″. The longest side of the second triangle is *n* inches. Find the lengths of the two remaining sides of the second triangle.

3 **3.** The three sides of a triangular plot are 32 ft., 28 ft. and 16 ft. Draw the plot to the scale, 1 inch = 16 feet. Take the 32-foot side as base and using the formula $A=\frac{1}{2}bh$, find as accurately as possible from the figure the area of the plot.

4 **4.** A new road 66 ft. wide was built across Mr. Kelly's farm, cutting out a parallelogram as shown in the figure at the right. How many square feet of his land did Mr. Kelly lose?



PART B

2 **5.** State the converse of the following theorem:

When a straight line cuts two parallel straight lines, the interior angles on the same side of the cutting line are together equal to two right angles.

Values

6 **6.** *Either* { Prove: If one side of a triangle is produced, the exterior angle so formed is equal to the sum of the two opposite interior angles. (Theorem 10)

Or { Prove: A quadrilateral is a parallelogram if two opposite sides are equal and parallel. (Theorem 18)

8 **7.** (*a*) Prove: Parallelograms on the same base and between the same parallels (or of the same altitude) are equal in area. (Theorem 20)

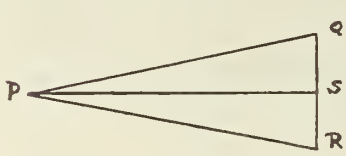
(*b*) Use this theorem to find the formula for the area of a parallelogram.

8. In each of the four parts which follow is a question on congruence. Give the answer "Yes" or "No" to each question. If your answer is "Yes," give your reason, stating the number or enunciation of the proposition that proves the congruence; if "No," give your reason, stating what further facts are necessary in order to prove congruence.

2 (1)

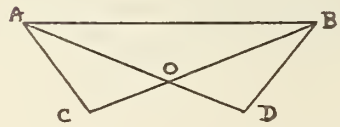
Given: AB is parallel to CD. Are triangles AOB and COD congruent?

2 (2)



Given: PQ is equal to PR. PS is perpendicular to QR. Are triangles PQS and PRS congruent?

2 (3)



Given: AO is equal to OB. CO is equal to OD. Are triangles ABC and BAD congruent?

2 (4)

Given: AD is equal to BC. DO is equal to OC. Are triangles AOD and COB congruent?

Values

9. Do any *two* of the following parts:

4 (*a*) Construct an isosceles triangle, having given the vertical angle and the perpendicular from the vertical angle to the base.

4 (*b*) An irregular quadrilateral ABCD represents a field. The owner divides it into two parts by building fences from opposite corners D and B to a point E which is exactly half-way between A and C.

Prove that the two parts DEBA and DEBC are equal in area.

4 (*c*) A is the vertex of an isosceles triangle ABC and BA is produced to D so that AD is equal to BA; if DC is drawn, show that BCD is a right angle.

45

№ 472

HIGH SCHOOL ENTRANCE EXAMINATION BOARD

DEPARTMENTAL EXAMINATIONS, 1937

GRADE IX

GENERAL SCIENCE AND HEALTH EDUCATION

Time—2½ hours.

Notes—Grade X and Grade XI candidates writing on General Science will not be required to write on that part of the paper based on Health Education.

Pay particular attention to the directions as you answer the questions. Answer as many questions as you can in the time allowed. Write your answers on this examination paper and enclose the paper in the envelope provided. No foolscap is needed.

Directions: On the line at the right, place the letter of the correct answer.

Values

Example: Air is a (a) solid, (b) liquid, (c) gas. .....c.....
Air is a gas. The correct answer is shown by placing the letter "c" on the line at the right.

5 **1.** A natural factor in our environment is (a) school, (b) radio, (c) book, (d) air, (e) automobile. (1).....

2. An artificial factor in our environment is (a) water, (b) air, (c) light, (d) heat, (e) steam-engine. (2).....

3. A general property of matter is (a) weight, (b) odor, (c) lustre, (d) magnetism, (e) compressibility. (3).....

4. A special propery of matter is (a) inertia, (b) weight, (c) indestructibility, (d) gravitation, (e) transparency. (4).....

5. An example of organic matter is (a) sand, (b) water, (c) humus, (d) air, (e) light. (5).....

6. Heat is a form of (a) matter, (b) energy, (c) oxidation, (d) thermometer, (e) work. (6).....

7. We get first-hand knowledge of our environment through (a) talking with our friends, (b) reading books, (c) observation and experimentation, (d) theories, (e) laws. (7).....

Values

8. A physical change occurs when (a) iron rusts, (b) water boils, (c) a match burns, (d) a leaf decays, (e) an apple rots. (8)_____

9. A body in motion illustrates (a) chemical change, (b) kinetic energy, (c) potential energy, (d) physical change, (e) loss of energy. (9)_____

10. Our main source of energy is (a) coal, (b) wood, (c) the sun, (d) oil, (e) water. (10)_____

Directions: In the space under each statement give the reason for what happens.

10 **11.** An automobile is brought to a stop when the brakes are applied.

.....

.....

.....

12. When watching a train from a distance, one observes the steam from the whistle a short time before he hears the sound.

.....

.....

.....

13. With a lever, I lift a 16-ounce weight using only an 8-ounce effort.

.....

.....

.....

14. I carry a weight up a stairway with a smaller expenditure of force than if I carry it the same height up a vertical ladder.

.....

.....

.....

15. When you push against a heavy wall you are expending energy but you are doing no work—as work is defined in science.

.....

.....

.....

Values

Directions: On the line at the right, place the word or words needed to make each statement true.

5 **16.** About four-fifths of the air is (16).....

17. Air exerts a pressure because it has (17).....

18. On the up-stroke of the piston, the piston valve of a lift pump is (18).....

19. A space that contains no matter is a (19).....

20. Fires said to be caused by spontaneous combustion are really caused by (20).....

21. Sound, to travel, requires a (21).....

22. The pressure exerted by compressed air is due to (22).....

23. In living plants and animals, respiration takes place in (23).....

24. An instrument used for weighing the atmosphere is a (24).....

25. The process by which iron is given a coating of zinc is called (25).....

Directions: Breathing occurs by means of (a) lungs, (b) lung sacs, (c) stomata, (d) tubes or tracheae, (e) gills, (f) the skin. Insert in the parentheses at the right the letter or letters showing the mode of breathing of each of the following:

6 **26.** 1. Insects ( )

27. 2. Fishes ( )

28. 3. Dogs ( )

29. 4. Plants ( )

30. 5. Earthworms ( )

31. 6. Birds ( )

[OVER]

Values

Directions: Water has a variety of uses. What fact about water accounts for its use in each of the following:

6 **32.** Making ice cream. (32) .....

.....

33. Water as a cleaning agent. (33) .....

.....

34. The formation of dew. (34) .....

.....

35. Hot-water heating system. (35) .....

.....

36. A ship floating in water. (36) .....

.....

37. Steam engines. (37) .....

.....

Directions: Under each question, answer in as few words as possible.

2 **38.** In Alberta the average temperature is lower in winter than in summer.

Why? .....

.....

2 **39.** A room is warmed by a hot stove in one corner.

Why? .....

.....

2 **40.** Electricity can be used as a source of heat.

Why? .....

.....

2 **41.** Storm doors and windows are placed on houses in winter time.

Why? .....

.....

Values

2 **42.** Wooden handles are placed on home utensils such as irons, tea-kettles, and coffee pots.

Why? .....

.....

2 **43.** Rails on a railway track are placed end to end with a short space between the ends of the rails.

Why? .....

.....

2 **44.** Two sights are placed on the barrel of a gun.

Why? .....

.....

2 **45.** Oil lamps are fitted with wicks which extend to the oil.

Why? .....

.....

2 **46.** When a beam of light enters a darkened room through a slit in a blind and falls upon the rough surface of a piece of white paper, the room is at once brighter.

Why? .....

.....

2 **47.** When a fuse is destroyed in your lighting system, never replace it by a piece of wire; insert a new fuse.

Why? .....

.....

2 **48.** The north pole of a bar magnet attracts the south pole of a compass needle.

Why? .....

.....

2 **49.** If a strip of zinc and a strip of copper or carbon are placed in dilute sulphuric acid and connected by a wire, a current of electricity will flow through the wire.

Why? .....

.....

2 **50.** State *four* ways in which the human race is dependent for existence on the sun's energy.

1. .....

2. .....

3. .....

4. .....

[OVER]

Values

2 **51.** Name *four* factors that contribute to soil-making.

1. .....
2. .....
3. .....
4. .....

2 **52.** Name *four* characteristics of a good garden soil.

1. .....
2. .....
3. .....
4. .....

2 **53.** State *four* ways in which micro-organisms act as beneficial agents.

1. .....
2. .....
3. .....
4. .....

2 **54.** State *four* conditions favorable to the growth of micro-organisms.

1. .....
2. .....
3. .....
4. .....

3 **55.** The following sentences represent the steps of an experiment. Show the proper order for these steps by arranging the letters on the line provided.

(*a*) Before entering a well, lower a lighted candle in a pail.
(*b*) Carbon dioxide does not support combustion.
(*c*) We lighted the splinter and let carbon dioxide flow upon it.
(*d*) Does carbon dioxide support combustion?
(*e*) Take carbon dioxide, a splinter and a match.
(*f*) The flame went out.

(55) .....

3 **56.** Directions: Draw *three* conclusions from the following observations:

(*a*) A candle in a covered jar soon goes out.
(*b*) A piece of wood lying on the table does not start to burn.
(*c*) Stones placed on a fire do not burn.

Conclusion 1. .....

Conclusion 2. .....

Conclusion 3. .....

Values

HEALTH EDUCATION

Directions: Show by a letter at the right, the group of words that best completes each of the following statements.

10 **57.** Pasteurization of milk means (a) boiling milk, (b) keeping it at 120 degrees F. for 50 minutes, (c) keeping it at 145 degrees F. for 30 minutes. (57).....

58. Pasteurization is done to (a) remove dirt, (b) prevent milk from souring, (c) kill harmful bacteria. (58).....

59. Chlorine may be added to drinking water to (a) remove sediment, (b) kill bacteria, (c) change the taste. (59).....

60. An artesian well means one that (a) is more than 30 feet in depth, (b) is drilled by means of a well point, (c) is below the first impervious or rock layer. (60).....

61. Wells are most frequently contaminated by (a) surface drainage, (b) sewage gases, (c) small animals getting into the well. (61).....

62. In candling eggs for freshness, one considers (a) the size of the egg, (b) the color of the yoke, (c) the air space in the egg. (62).....

63. Control of the fly pest is best accomplished by (a) screening the doors and windows, (b) proper disposal of refuse, (c) the use of fly paper or fly poison. (63).....

64. A septic tank is better than a cesspool for disposing of waste because (a) it holds more, (b) it provides for the breaking down of waste by bacteria, (c) it is easier to repair. (64).....

65. Hard water is not so desirable as soft water for household purposes because (a) the minerals might be poisonous, (b) it stains dishes and pans, (c) it wastes soap. (65).....

66. Garbage should be wrapped, covered and disposed of at short intervals because (a) it is a good breeding place for flies, (b) the odor is objectionable, (c) it may cause an epidemic. (66).....

[OVER]

Values

8 **67.** Directions: Write a note on any *one* of the following:

(*a*) Food values to be considered in planning a good diet.
(*b*) The control of communicable diseases.
(*c*) The care of the eyes and prevention of blindness.
(*d*) Steps to be taken to reduce automobile and traffic accidents.

Answer:

90

APPENDIX 11

Usage as Reported by 229 Judges -- Taken from "Current English Usage" by Sterling A. Leonard

The judges were drawn from these groups: linguistic experts, active members of the National Council of Teachers of English, well known authors, editors of influential publications, leading business men, members of the Modern Language Association and teachers of speech. The authors place particular emphasis on the judgment of the linguists...."The first group of judges comprised a number of the foremost linguistic experts in the world -- lexicographers, philologists and grammarians. As trained observers of language ways, they were naturally qualified above all others to estimate the standing in actual cultivated use of the various items on the ballot." The judges were asked to give their observation of actual usage, not what usage should be in their opinion. Of the 229 judges, 150 were teachers included in 3 of the above groups. There were 19 business men and 30 linguists.

The ranking was arranged under three heads: established usage (literary or good colloquial), i.e., items approved by at least 75% of the judges and disapproved by not more than 25%; disputable usage, items approved by more than 25% of the judges and disapproved by fewer than 75%; illiterate or uncultivated usage, items disapproved by more than 75% of the judges and approved by fewer than 25%.

There follows the list of rankings in the first two categories. The ranking of the linguists is taken as the main classification, but column A lists the judgment of the whole 229 judges. Column B lists the order of preference of 97 of the 230 items by the judges, considered by groups. "The weights assigned to each item by each group of judges were totalled, and the resulting index number was used in effecting the arrangement." Since under column B, 130 of the 230 items were not considered by the judges, this column is not very significant. The other two columns, however, can be directly compared with each other. Note that the linguists and the total number of judges compared as follows in their total ratings:

Linguists--established usages, 107; plus disputable usages, 187. All the judges--established usages, 77; plus disputable usages, 182.

The monograph (230pp) gives an extended treatment of each of the usages discussed. It also includes a treatment of punctuation usage.

RANKING OF USAGES

B	A	Established by Linguists
	2	1. A TALE OF TWO CITIES is AN historical novel.
	1	2. It was I that brake the vase, father.
	7	3. Why PURSUE a vain hope?
	6	4. ONE rarely enjoys ONE'S luncheon when one is tired.
	9	5. The invalid was able PARTIALLY TO RAISE his body.
21	3	6. It BEHOOVES them to take action at once.
8	30	7. I HAD RATHER go at once.
	11	8. IN THIS CONNECTION, I should add ...
7	19	9. This is a man...I used to know. (Omitted relative)
6	28	10. You HAD BETTER stop that foolishness.
	10	11. Each person should of course bear HIS OR HER share of the expense.
	29	12. Galileo discovered that the earth MOVED.
	4	13. This hat is NOT SO large as mine.
	13	14. My position in the company was satisfactory from every POINT of view.
1	12	15. He toils TO THE END THAT he may amass wealth.
	17	16. IN THE CASE of students who elect an extra subject, an additional fee is charged.
	21	17. The defendant's case was HURT by this admission.
	20	18. I FOR ONE hope he will be there.
	22	19. This is the chapter WHOSE contents cause most discussion.
2	15	20. UNDER THESE CIRCUMSTANCES I shall concede the point.
	32	21. I have no prejudices, and THAT is the cause of my unpopularity.
	5	22. You may ask WHOMSOEVER you please.
	18	23. The honest person is to be APPLAUDED.
	23	24. He stood IN FRONT OF the class to speak.
	24	25. THIS MUCH is certain.
4	33	26. He did NOT do AS well AS we expected.
	D 79	27. We GOT HOME at three o'clock.
	35	28. He has no fear; nothing can CONFUSE him.
	D 87	29. There is a large WORKS near the bridge.
26	D 81	30. AS REGARDS THE LEAGUE, let me say ...
	58	31. "You just had a telephone call." "DID THEY Leave any message?"
	38	32. I was attacked by one of THOSE huge police dogs.
	45.	33. The women were ALL DRESSED UP.
23	49	34. This was the REASON WHY he went home.
	D 89	35. This book is valueless, that one has more to recommend it. (comma splice.)
	26	36. Take two CUPS of flour.
24	D 84	37. NONE of them ARE here.
	39	38. I DROVE the car around the block.
	31	39. He doesn't do it THE WAY I do.
	71	40. The New York climate is the HEALTHIEST in the fall.
13	50	41. I felt I could walk no FURTHER.

RANKING OF USAGES

B	A	Established by Linguists
	36	42. One is not FIT to vote at the age of eighteen.
	34	43. Our catch was PRETTY good.
	26.	44. We have made some progress ALONG THESE LINES.
	44	45. The catcher stands BACK OF the home plate.
	8	46. My colleagues and I SHALL be glad to help you.
	64	47. I went immediately into the banquet room, WHICH was, I found later, a technical error.
5	27	48. That will be ALL RIGHT, you may be sure.
43	D99	49. We will TRY AND GET it.
	D 103	50. We cannot discover FROM WHENCE this rumor emanates.
	54	51. I can hardly STAND him.
	46	52. Jane WAS HOME all last week.
	40	53. I'D LIKE to make a correction.
25	72	54. I've absolutely GOT to go.
15	48	55. We can expect the commission TO AT LEAST PROTECT OUR INTERESTS.
22	52	56. That's a dangerous curve; you'd better go SLOW.
	41	57. There are some NICE people here.
12	42	58. WILL you be at the Browns' this evening?
17	47	59. Have you FIXED the fire for the night?
	65	60. I don't know IF I can.
	D 100	61. IN HOPES OF seeing you, I asked...
	D 101	62. IT says in the book that...
	68	63. If it WASN'T for football, school life would be dull.
	37	64. His attack on my motives made me PEEVISH.
	59	65. We TAXIED to the station to catch the train.
30	D96	66. We ONLY had one left.
	D85	67. My VIEWPOINT on this is that we ought to make concessions.
	D82	68. Factories were MOSTLY closed on election day.
	D93	69. He moves mighty QUICK on a tennis court.
	51	70. He stopped to PRICE some flowers.
	69	71. He worked with much SNAP.
28	70	72. This room is AWFULLY cold.
56	D124	73. It is ME.
55	D131	74. WHO are you looking for?
41	D112	75. A treaty was concluded BETWEEN THE FOUR POWERS
18	57	76. YOU had to have property to vote, in the eighteenth century.
	61	77. The kind of apples you mean ARE large and sour.
	D 104	78. I have a HEAP of work to do.
	D 88	79. I FELT BADLY about his death.
	66	80. The real REASON he failed WAS BECAUSE he tried to do too much.
	D 111	81. Invite WHOEVER you like to the party.
44	D 97	82. Drive SLOW down that hill.
	14	83. Harry was a little shaver about THIS tall.

RANKING OF USAGES

B		A		Established by Linguists
		62	84.	I didn't speak to my uncle by long distance; I couldn't GET THROUGH.
		67	85.	THEY had numerous strikes in England.
39	D	105	86.	I will go PROVIDING you keep away.
45	D	114	87.	I have GOT my own opinion on that.
	D	115	88.	He made a DATE for next week.
	D	83	89.	My father walked very SLOW down the street.
47	D	121	90.	There WAS a bed, a dresser, and two chairs in the room.
	D	109	91.	They invited my friends and MYSELF.
	D	106	92.	It is now PLAIN AND EVIDENT why he left.
	D	113	93.	I wish I WAS wonderful.
	D	110	94.	I've no doubt BUT WHAT he will come.
33	D	94	95.	What was the reason for BENNETT MAKING that disturbance?
69	D	150	96.	CAN I be excused from this class?
42	D	122	97.	Haven't you GOT THROUGH yet?
54	D	78	98.	EVERYONE was here, but THEY all went home early.
		63	99.	He LOANED me his skates.
34	D	90	100.	My FOLKS sent me a check.
	D	107	101.	He came AROUND four o'clock.
	D	135	102.	If it had been US, we would admit it.
		73	103.	They went WAY around by the orchard road.
9	T	74	104.	The banker LOANED me $200 at 6%.
20	T	75	105.	PIKES peak is in Colorado.
90	T	76	106.	The sailors LAID out along the yards.
	T	77	107.	Is your insurance sufficient COVERAGE for your house?

B		A		Disputable -- Linguists
		60	108.	That clock must be FIXED.
		43	109.	My contention has been PROVEN many times.
	D	120	110.	Sam, who was then in town, was with me THE THREE OR FOUR FIRST days.
3		16	111.	ONE rarely likes to do as HE is told.
16		55	112.	He never works EVENINGS or SUNDAYS.
31	D	98	113.	They have GOTTEN a new car this year.
14		53	114.	The Rock Island DEPOT burned down last night.
	D	123	115.	Sitting IN BACK OF John, he said, "Now guess what I have."
	D	126	116.	I took it to be THEY.
35	D	108	117.	I GUESS I'll go to lunch.
19		56	118.	He went RIGHT home and told his father.
40	D	118	119.	He could write AS WELL OR BETTER than I.
32	D	144	120.	I EXPECT he knows his subject.
37.	D	102	121.	I CAN'T SEEM to get this problem right.
	D	126	122.	I was pretty MAD about it.
72	D	157	123.	EITHER of these three roads is good.

RANKING OF USAGES

B	A	Disputable --- Linguists
	D 159	124. You are older than ME.
83	D 178	125. What are the chances of THEM being found out?
38	D 116	126. There is A big WOODS near the house.
	D 127	127. I know it to be HE.
	D 95	128. Do you WISH for some ice cream?
	D 171	129. Intoxication is WHEN the brain is affected by certain stimulants.
	D 154	130. NEITHER OF your reasons ARE really valid.
29	D 91	131. He DOVE off the pier.
60	D 142	132. Trollope's novels have already begun to DATE.
	D 141	133. Will you go? SURE.
65	D 148	134. He is KIND OF SILLY, I think
46	D 117	135. I WILL PROBABLY come a little late.
	D 145	136. That was the reason for ME LEAVING school.
78	U, I 184	137. They EAT (et) dinner at twelve o'clock.
	D 155	138. I'll swear that was HIM.
	D 179	139. Well, that's GOING SOME.
51	D 128	140. LEAVE me alone, or else get out.
74	D 161	141. Of two disputants, the WARMEST is generally in the wrong.
59	D 132	142. It was GOOD AND COLD when I came in.
	D 156	143. We haveN'T BUT a few left.
	D 119	144. In the collision with a Packard, our car naturally got the WORSE of it.
	D 143	145. I wouldn't have said that if I had thought it WOULD HAVE shocked her.
	D 164	146. YOURSELF and your guests are invited.
66	D 140	147. The man was VERY AMUSED.
27	D 86	148. Such NAIF actions seem to me absurd.
75	D 169	149. It seems to be THEM.
76	D 166	150. Everybody bought THEIR own ticket.
	D 151	151. SAY, do you know who that is?
	D 162	152. I suppose that's HIM.
52	D 133	153. I CAN'T HELP BUT eat it.
80	U, I 185	154. AREN'T ('nt or rnt) I right?
20	D 158	155. There is a row of beds with a curtain BETWEEN EACH BED.
62	D 136	156. If I asked him, he would LIKELY refuse.
	D 160	157. John didn't do so BAD this time.
	D 92	158. Cities and villages are being stripped of all they contain NOT ONLY, BUT often of their very inhabitants.
	D 80	159. EVERYBODY'S ELSE affairs are his concern.
	D 165	160. It DON'T make any difference what you think.
	D 182	161. I read in the paper WHERE a plane was lost.
61	D 146	162. That boy's mischievous behavior AGGRAVATES me.
	U, I 192	163. The stock market collapse left me BUSTED.
82	U, I 195	164. Neither author nor publisher ARE subject to censorship.
	D 129	165. Yes, our plan worked just FINE.
62	D 153	166. The fire captain with his loyal men were cheered.

RANKING OF USAGES

B	A	Disputable -- Linguists
86	U,I 198	167. Don't get THESE kind of gloves.
49	D 137	168. The British look at this differently THAN we do.
68	D 147	169. MOST anybody can do that.
63	D 149	170. It is LIABLE to show tonight.
	D 168	171. They went in SEARCH FOR the missing child.
	U,I 191	172. I suppose I'm wrong, AIN'T I?
58	D 138	173. John was RAISED by his aunt.
	D 175	174. Martha DON'T sew as well as she used to.
	D 163	175. He MOST always does what his wife tells him.
	U,I 187	176. It SURE was good to see Uncle Charles.
53	D 130	177. My experience on the farm helped me SOME, of course.
67	D 152	178. It's REAL cold today.
73	D 172	179. His presence was valueless NOT ONLY, but a hindrance as well.
77	D 174	180. We don't often see sunsets LIKE they have in the tropics.
87		181. I am older than HIM.
81	D 173	182. She leaped off OF the moving car.
85	U,I 186	183. She SUNG very well.
71	D 170	184. It is only a little WAYS farther.
79	D 177	185. It looked LIKE they meant business.
	U,I 190	186. Do it LIKE he tells you.
48	D 134	187. The child was weak, DUE TO improper feeding.